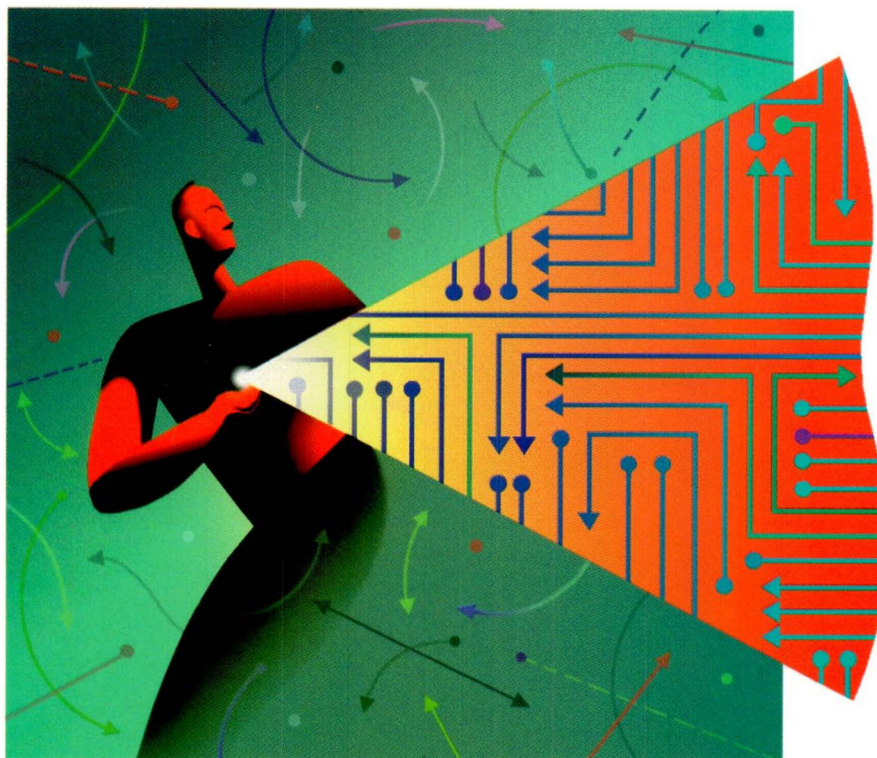


Meridian 1

System upgrade guide Canada and CALA

Book 1 of 2



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Communication Systems



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**System upgrade guide
Canada and CALA**

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BK 1 OF 2



Meridian 1

Upgrade Procedures

**Upgrades for X11 release 20
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General information

This document describes how to upgrade SL-1 and Meridian 1 systems running on hardware and software prior to X11 release 19, to SL-1 and Meridian 1 systems running on X11 release 19 software.

When upgrading a system to X11 release 19, in addition to this document, refer to following documents:

- *Installation and maintenance guide* (553-3001-210)
- *Software conversion procedures* (553-2001-320)
- *Upgrade engineering* (Appendix 1 to 553-3001-150)
- *Circuit card installation and testing* (553-3001-211)
- *Disk drive upgrade procedures* (553-3001-251)
- *X11 input/output guide* (553-3001-400)
- *X11 features and services* (553-3001-305)

Meridian 1

Upgrade Procedures

Upgrades for X11 release 20

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Upgrading to
Option 21E

SL-1 QCA6 cabinet upgrade to Meridian 1 Option 21E

This procedure is used to upgrade an SL-1 QCA6 cabinet (L or LE) to Meridian 1 Option 21E. To upgrade to a Meridian 1 Option 21E system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 21E:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 21E operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 21E is operating with the new software provided with the Option 21E.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 21E operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Modular upgrade of SL-1 QCA6 cabinet (L or LE) to Meridian 1 Option 21E

Equipment required

Table 1-1 lists minimum hardware requirements needed to modular upgrade a QCA6 cabinet to a Meridian 1 Option 21E.

Table 1-1
Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT6D43AA or NT7D04AA RIs 3	CE/PE power supply DC
		NT7D00AA	Top cap AC
1	1	NT7D00BA RIs 2	Top cap DC
	1	NT7D09CA	Pedestal DC
1		NT7D14AA or NT8D29AA RIs 4	CE/PE power supply AC
1		NT8D11AB RIs 2	CE/PE module AC
	1	NT8D11DC	CE/PE module DC
1		NT8D27AB RIs 3	Pedestal AC
1	1	NT8D22AC	System monitor
1		NT8D52AA	Pedestal blower unit AC
	1	NT8D52DC	Pedestal blower unit DC (DC system)
1		NT8D53AB RIs 5	Power distribution AC
-continued-			

Table 1-1 (continued)
Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT8D17AA Rls 9	Conference/TDS circuit card
1	1	NT8D18AA Rls 9	Digitone Receiver Network card
1	1	NT8D41AA Rls 2	2 Port SDI Paddle Board
1	1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	1	NT8D46AL	System monitor serial link cable
1	1	NT8D46BH	System monitor to SDI cable
1	1	NT8D82	MSPS to I/O cable
3	3	NT8D84AA	SDI Paddle Board to I/O Cable
1	1	NT8D95AJ	SDI I/O panel to DTE/DCE, 16 ft (4875 mm)
1	1	NT9D33AA	Small System Multi-Drive Unit (SMDU)
1	1	NT9D34AA	Enhanced Multi-Drive System Interface (EMSI)
1	1	NT9D47AB	EMSI to SMDU Data Cable, 2 ft (610mm)
	1	or NT9D47AD	EMSI to SMDU Data Cable, 6 ft (1830mm)
1	1	NT9D66AB	EMSI to SMDU Power Cable, 2 ft (610mm)
	1	or NT9D66AD	EMSI to SMDU Power Cable, 6 ft (1830mm)
1	1	NTND01CA	12MB CPU/Memory Card
1	1	NTND02AB Rls 2	Misc, Dual SDI Peripheral Signaling Pack with Battery (MSPS)
1	1	NTND31AA Rls 3	ROM daughterboard
1	1	NTND37AA	MSPS I/O to DTE/DCE cable 8 ft (2440 mm)
1	1	QPC84Q	Power Monitor

Note: The vintages shown on circuit cards in Table 1-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA6 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 21E Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 21E to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 21E to the existing cabinet.
- A second NT8D86 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Note: The second NT8D86 cable is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as a QCA7 or 8) do not require the second NT8D86 cable since the NT8D73 cable can be connected directly to the Peripheral Buffer connector. For existing cabinets equipped to suppress EMI, refer to 553-3001-150, *Upgrade Engineering*.

Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

Upgrading consists of:

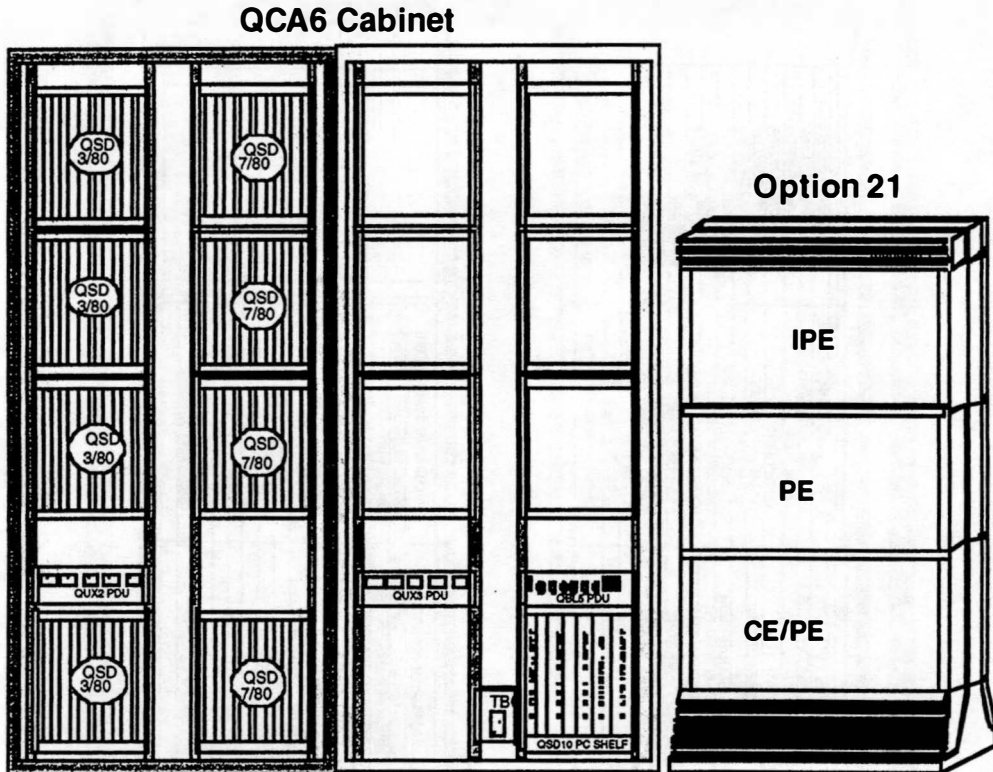
- installing the Meridian 1 Option 21E system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 1-1 shows a typical QCA6 cabinet and Figure 1-2 shows a QCA6 cabinet that has been upgraded to Meridian 1 Option 21E.

Figure 1-2

Typical QCA6 cabinet that has been upgraded to Meridian 1 Option 21E



Installing the Meridian 1 Option 21E system

The Option 21E equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, CPU/Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 21E equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 1-2 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.

- Install cabling:
 - Cable common equipment
 - Cable network loops (within the Option 21E columns only).
- Note:** Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.
- Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 21E equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 1-3 shows Option 21E circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 1-2
NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 1-2 (continued)**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 1-2 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 Indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves				Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."					
For each slave, indicates the slave address				Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."					
SW3 Indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master		on						
	slave		off						
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

Table 1-2 (continued)

NT8D22 system monitor — settings for total number of slaves — SW2 on master

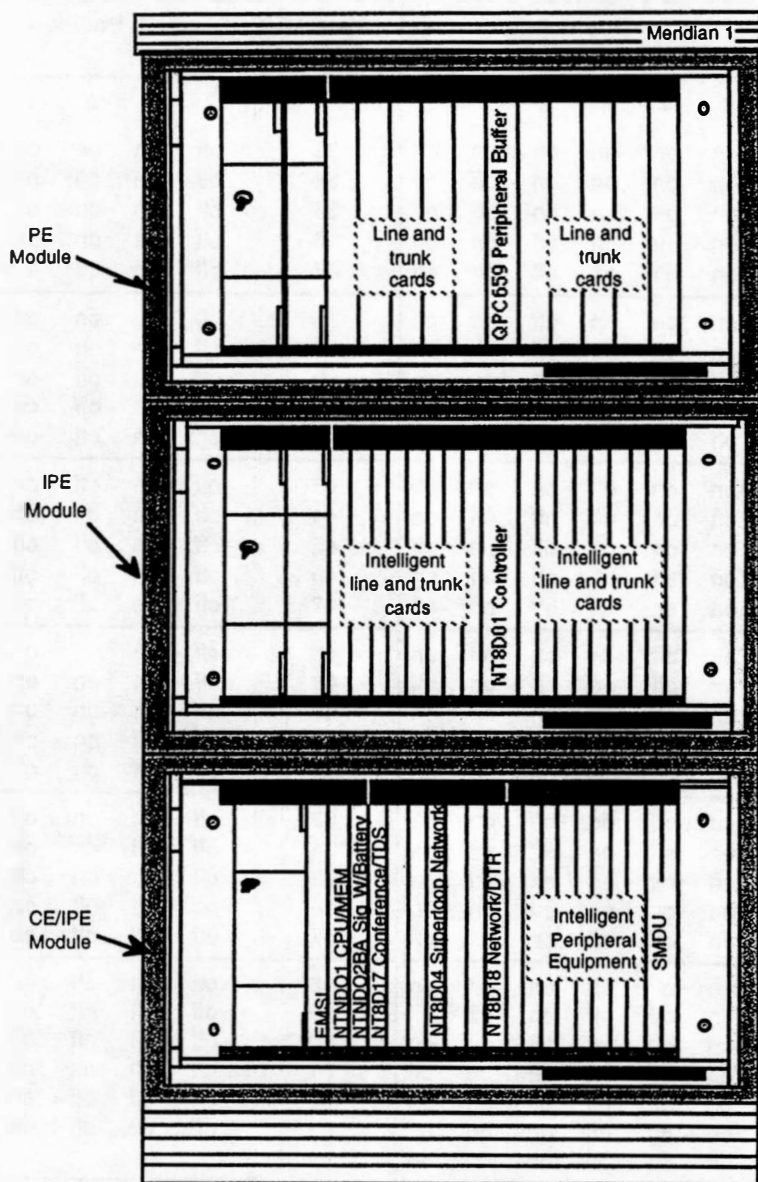
How many slave units	Switch position						How many slave units	Switch position					
	3	4	5	6	7	8		3	4	5	6	7	8
0	on	on	on	on	on	on	32	off	on	on	on	on	on
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
— continued —													

Table 1-2 (continued)

NT8D22 system monitor — slave address — SW2 on slave

Slave unit address							Position							Slave unit address							Position						
	3	4	5	6	7	8		3	4	5	6	7	8		3	4	5	6	7	8		3	4	5	6	7	8
1	on	on	on	on	on	off	33	off	on	on	on	on	off	33	off	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	on	off	34	off	on	on	on	on	off	34	off	on	on	on	on	off	34	off	on	on	on	on	off
3	on	on	on	on	on	off	35	off	on	on	on	on	off	35	off	on	on	on	on	off	35	off	on	on	on	on	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on	36	off	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off	37	off	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on	38	off	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off	39	off	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on	40	off	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off	41	off	on	off	on	on	on	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on	42	off	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off	43	off	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on	44	off	on	off	off	on	on	44	off	on	off	on	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off	45	off	on	off	off	on	off	45	off	on	off	on	off	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on	46	off	on	off	off	off	on	46	off	on	off	off	on	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off	47	off	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on	48	off	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off	49	off	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on	50	off	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off	51	off	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on	52	off	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off	53	off	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on	54	off	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off	55	off	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on	56	off	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off	57	off	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on	58	off	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off	59	off	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on	60	off	off	off	off	on	on	60	off	off	off	on	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off	61	off	off	off	off	on	off	61	off	off	off	on	off	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on	62	off	off	off	off	off	on	62	off	off	off	off	on	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off	63	off	off	off	off	off	off	63	off	off	off	off	off	off
32	off	on	on	on	on	on																					

Figure 1-3
Meridian 1 Option 21E CPU/IPE module with IPE and PE modules



Connecting system ground and power**Ground**

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 21E: one designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 21E, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Note: Depending on the power configuration used it may be required to do modifications to the existing cabinets. If modifications are required, do them as part of the cut-over procedures (described later in this document) to avoid unnecessary interruption of service to the end users.

Connect the DC power to the Option 21E columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 21E equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 21E module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 21E modules.

- a new power source installed in conjunction with the Option 21E.

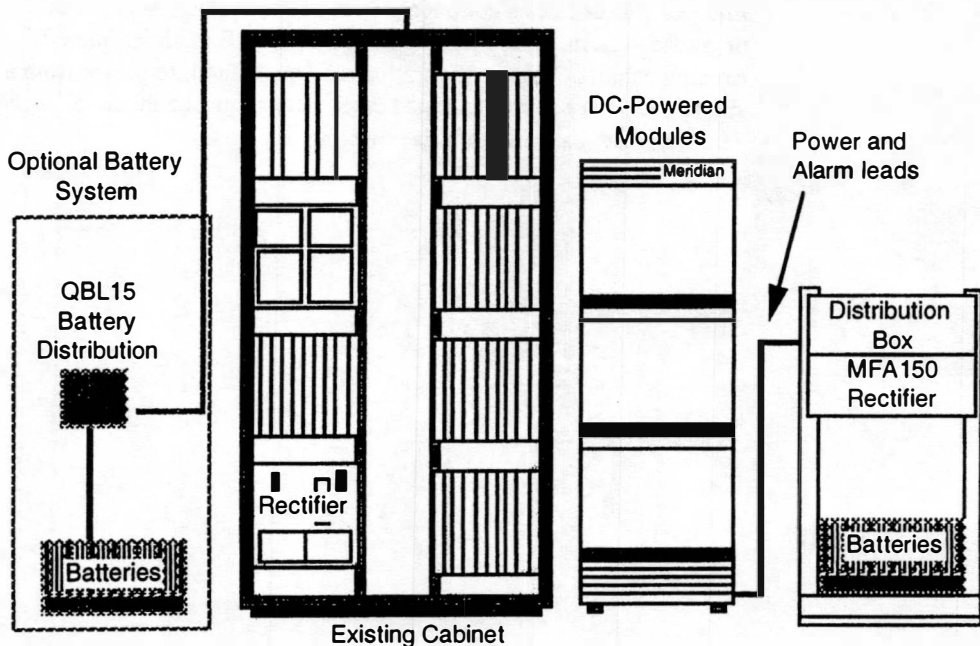
To determine the power requirements for the Option 21E system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 1-4 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 21E modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 21E column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 1-4

Typical arrangement of Independently DC-powered Meridian 1 Option 21E modules

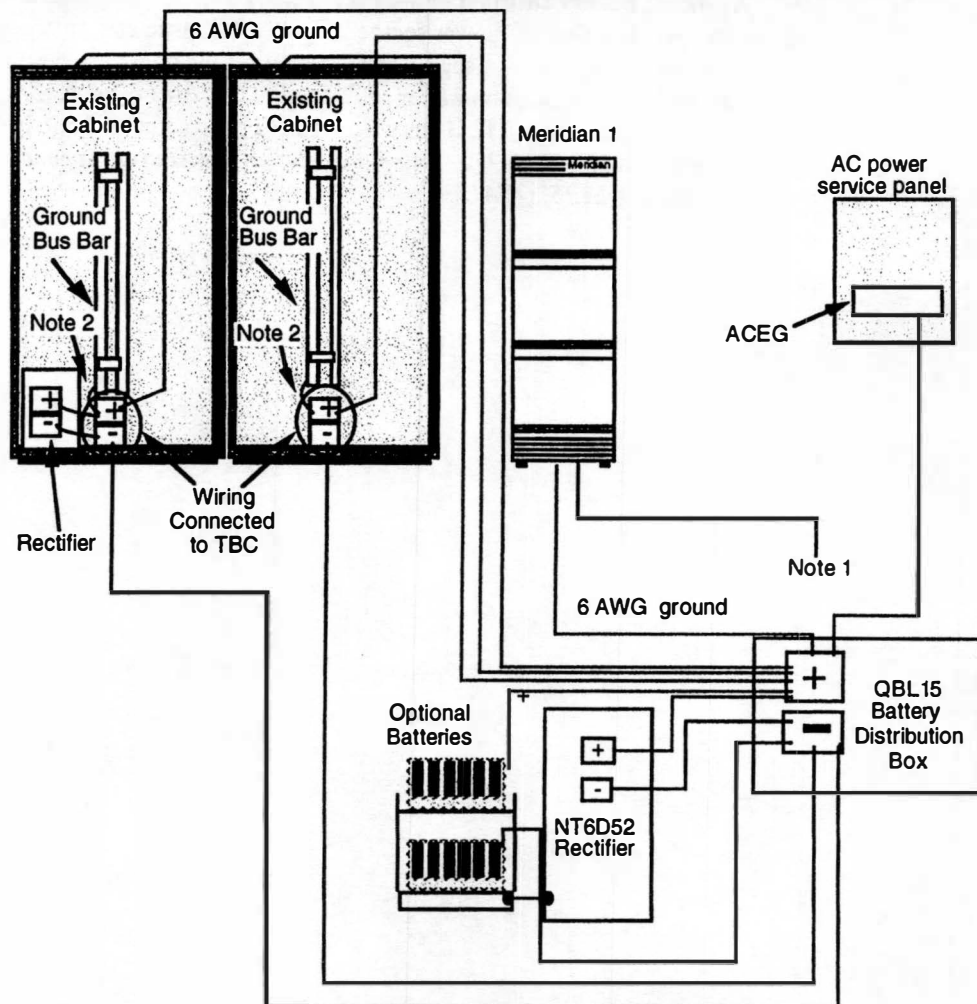


Note: An MFA150 cannot share a battery string connected to QBL15, QBL12 or QCA13. A separate battery string is required for the MFA150.

Common power source

Existing cabinet rectifier as a common power source

- When the existing cabinet DC power source is used as a common power source for the cabinet and the column, any QSD4 rectifier will have to be replaced with a QRF8 rectifier and the existing battery distribution box will have to be replaced with a QBL15 battery distribution box. For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 1-5 illustrates a common power supply arrangement for the upgraded system. This includes both Option 21E modules and the existing cabinet. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

Figure 1-5**Typical arrangement using a common DC power supply with optional battery backup**

Note 1: DC power feeds from the QBL15 to the Meridian 1. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

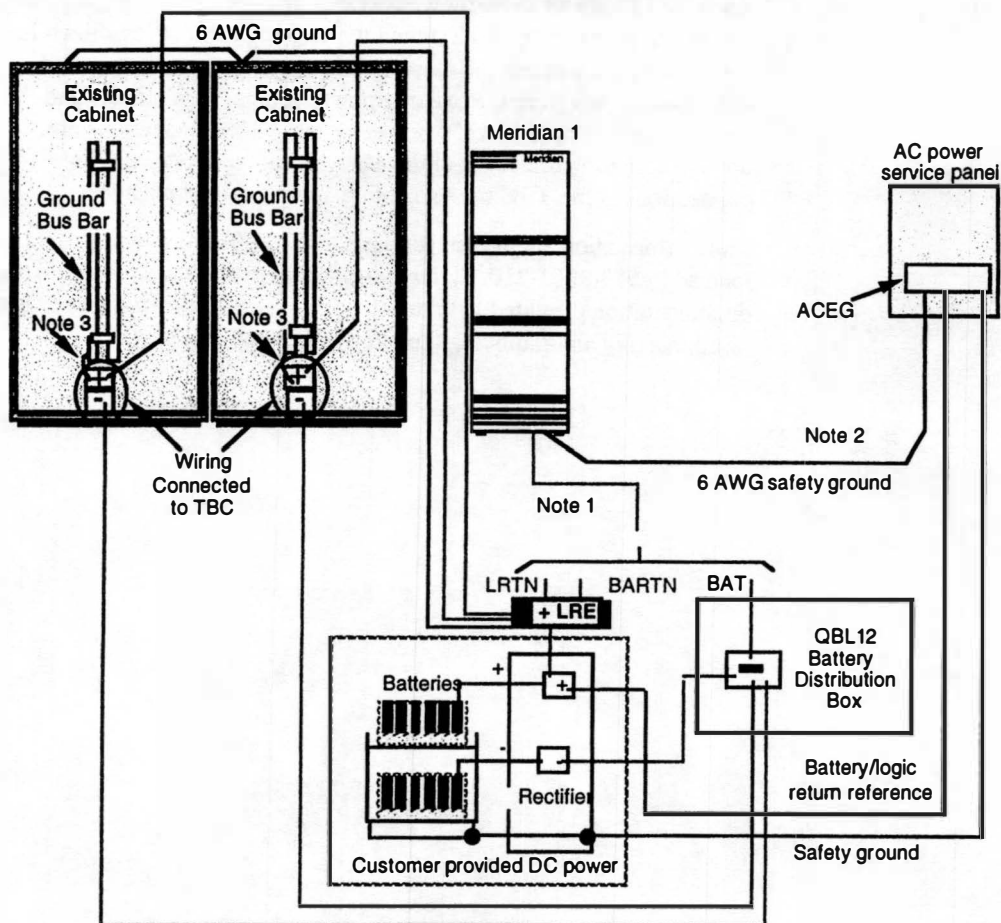
Note 2: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

Customer provided power as a common power source

- A QBL12 Battery Distribution Box is normally used to connect to a customer provided DC power source. Figure 1-6 illustrates a customer provided common power supply arrangement for the upgraded system. This includes both Option 21E modules and the existing cabinet. A full description of QBL12 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 1-6
Typical arrangement using a customer provided common DC power supply



Note 1: DC power feeds. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

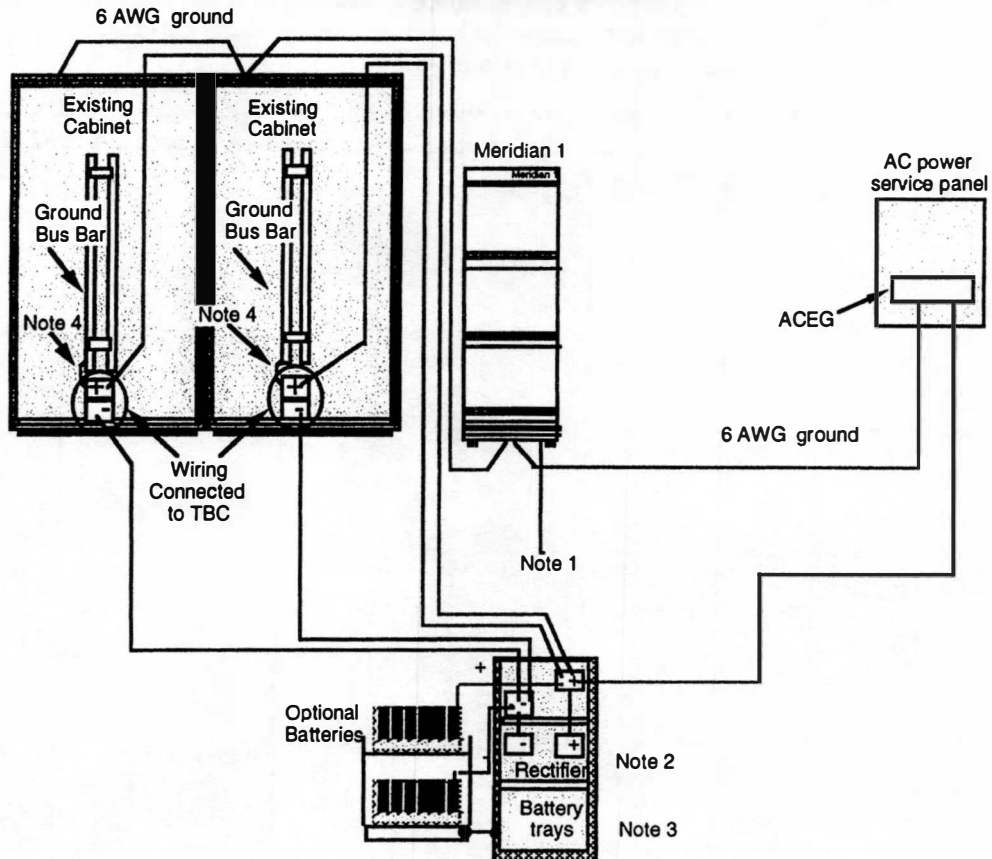
Note 2: With customer provided power equipment, the Meridian 1 frame requires a direct connection to the ACEG. In addition, the positive bus bar in the customer provided equipment must connect to the ACEG.

Note 3: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

An MFA150 power system as a common power source

- An MFA150 power system assembly can be used as a common power source for both the Option 21E and the existing cabinets as shown in Figure 1-7. To connect the existing cabinets, disconnect the + and - 48V power leads from the existing power source, then reroute and connect them to the MFA150 power system. The connections are located under the top cover of the MFA150 power system. The connections at the TBC of the existing cabinet do not change.
- More information about connections for the MFA150 power system is located in 553-3001-210, *System installation procedures*. Refer to the documentation provided with the existing system for information about disconnecting and removing the old rectifier and batteries.

Figure 1-7**Typical arrangement using an MFA150 power system as a common power source**

Note 1: DC power feeds from the MFA150 to the Meridian 1. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

Note 2: The MFA150 power system may be equipped with one or two power shelves for a maximum of 75 amps or 150 amps respectively.

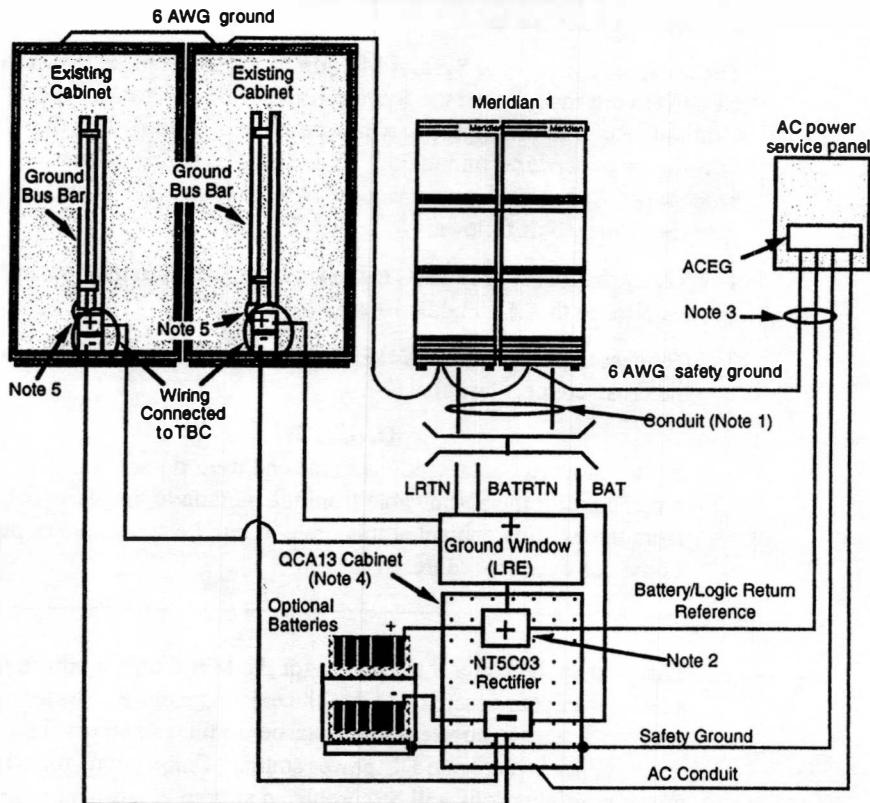
Note 3: Batteries may be installed in two optional battery trays located under the rectifier shelves.

Note 4: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

An existing QCA13 power cabinet as a common power source

- A QCA13 power cabinet equipped with rectifiers can be used as a common power source for both the Option 21E and the existing cabinets as shown in Figure 1-8.
- For information about connections for the QCA13 power cabinet, refer to 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 1-8**Typical arrangement using a QCA13 as a common power source**

Note 1: DC power feeds to Meridian 1 pedestals. Each feed consists of two BAT (-), two BATRTN (+), and one LRTN (+) conductors. If required, conductors can be run in conduit as shown. BAT (-) connects to the appropriate fuse in the rectifier cabinet.

Note 2: The QCA13 cabinet does not contain a bus for terminating individual battery and logic returns. A ground window should be used to consolidate all battery and logic returns.

Note 3: The Battery/Logic Return Reference wiring and the safety ground wiring must be #6 AWG, minimum.

Note 4: Up to four NT5C03 rectifiers can be equipped in a QCA13 cabinet for a total of 200 amps.

Note 5: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 21E modules.

These cables connect the System Monitor to the SDI Paddle Board in the CPU/Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section '**Separate power source**' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 1-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the new system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 21E system:

- 1 Power up and initially load the Option 21E column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.
- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
- 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
- 4 The Meridian 1 Option 21E system is now operational.

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 21E column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 Connect an NT8D86 cable between the connector on the faceplate of the network card and the I/O panel of the Option 21E. One cable is required for each network loop.
- 2 Connect an NT8D73 shielded cable, up to 30 ft (9 m) in length, to the connector on the I/O panel of the Option 21E. Route the NT8D73 cable to the existing cabinet. Do not connect it to the Peripheral Buffer card in the existing cabinet at this time.

Note: Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

- 3 If required in the existing cabinet (see Note) connect an NT8D86 cable to the connector on the NT8D73 shielded cable from the Option 21E. Make sure that the connectors are locked together with the locking devices. Do not connect the cable to the faceplate of the Peripheral Buffer card at this time. It will be connected as part of the cutover procedure.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable.

Cutting-over

The following procedure describes how to cut-over to the Option 21E system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL12 or QCA13 unit**
Remove the fuses from the -48V fuse panel corresponding to each cabinet and column.
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.

Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.

 - **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
 - **AC powered modules**
Set the AC power supply breaker at the AC power service panel to OFF.
- 2 If required, perform power modifications to the existing cabinets as described in step 3.
- 3 In the existing cabinets, remove the wiring connecting the frame of the cabinet to the positive (+) connection of the TBC, and the wiring connecting the frame to the cabinet ground bus bar. Refer to Figures 1-5 through 1-8.

Note: This wiring was factory installed. It must be removed to avoid ground loops when existing cabinets are used with Meridian 1 modules.

- 4 This step applies only to Meridian 1 modules connected to a DC power source.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 1-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

- 5 This step applies only if a new common power source with battery backup connected to a QBL12, QBL15 or QCA13 battery distribution box is to be used.

Note: This step does not apply if the common power source uses an MFA150 power system.

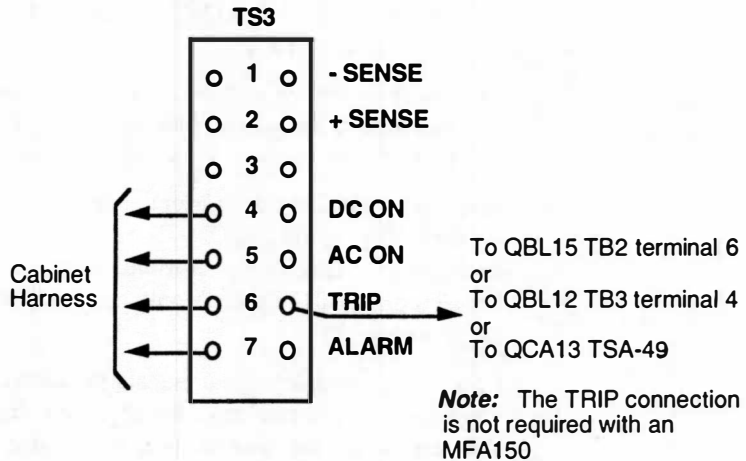
A TRIP lead must be connected to the TRIP connection on:

- the TRIP terminal on the terminal strip on the rectifier in existing cabinets equipped with a rectifier.
- the TRIP terminal of TS3 in existing cabinets not equipped with a rectifier.

The TRIP leads must be connected as follows.

If the existing rectifier is being removed from the cabinet, make the following wiring changes.

- a) If not already connected to TS3, tag and move the cabinet harness DC ON, AC ON, TRIP and ALARM leads presently connected on the rectifier to TS3 as shown in the above drawing. Depending on the type of existing cabinet, the TS3 is located either on the cabinet's TBC block, or on the QUT3 power unit.



- b) Install and connect a 16 AWG wire from terminal 6 (TRIP) on TS3 to the TRIP connection in the QBL12, QBL15 or QCA13 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connections in each cabinet with 16 AWG wire.
- c) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.

Note: The DC ON, AC ON and ALARM lead functions are performed by the Meridian 1 module. Leaving these leads connected in the existing cabinets only extends the alarm indicators to the QPC84 power monitors. If you wish, you may leave these leads disconnected. However, the TRIP lead must be connected.

If the existing rectifier is to remain in the cabinet, make the following wiring changes.

- a) Install and connect a 16 AWG wire from the TRIP connection on the terminal strip of the rectifier to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connection on the terminal strip of the rectifier in each cabinet with 16 AWG wire. In existing cabinets not equipped with a rectifier (such as a QCA7 cabinet powered by a QCA8 cabinet), 'daisy chain' to the TRIP connection on TS3.
 - b) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.
- 6 Remove the QPC84 Power Monitor from the QCA6 cabinet and set switch C11, position 2 to ON. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required. Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.
- Note:** Disregard any remaining alarm indications. Alarm indications should return to normal once the upgrade is completed and equipment that is no longer required has been removed as described later in this chapter.
- 7 Cross-connect the alarm cables as shown in Figure 1-10.
- 8 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.

- 9 Connect the NT8D86 cables (if provided) or NT8D73 shielded network cables from the Option 21E to the connector on the faceplate of the Peripheral Buffer circuit card in the existing cabinets.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly.

Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable. The NT8D73 shielded cable can be connected directly to the connector of the Peripheral Buffer card.

—OR—

If the existing cabinet is equipped to suppress EMI, the NT8D73 shielded cable should be connected to its assigned filter connector.

See 553-3001-150, *Upgrade Engineering* for more information.

- 10 Restore power to the cabinets and column by reinserting the removed fuse and resetting all circuit breakers to ON.

CAUTION

Do not remove the NT8D22 system monitor (XSM) from the column while the system is in service. Removing the XSM may cause the input circuit breakers on the existing cabinets to trip.

- 11 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Figure 1-9
NT8D46 cable types

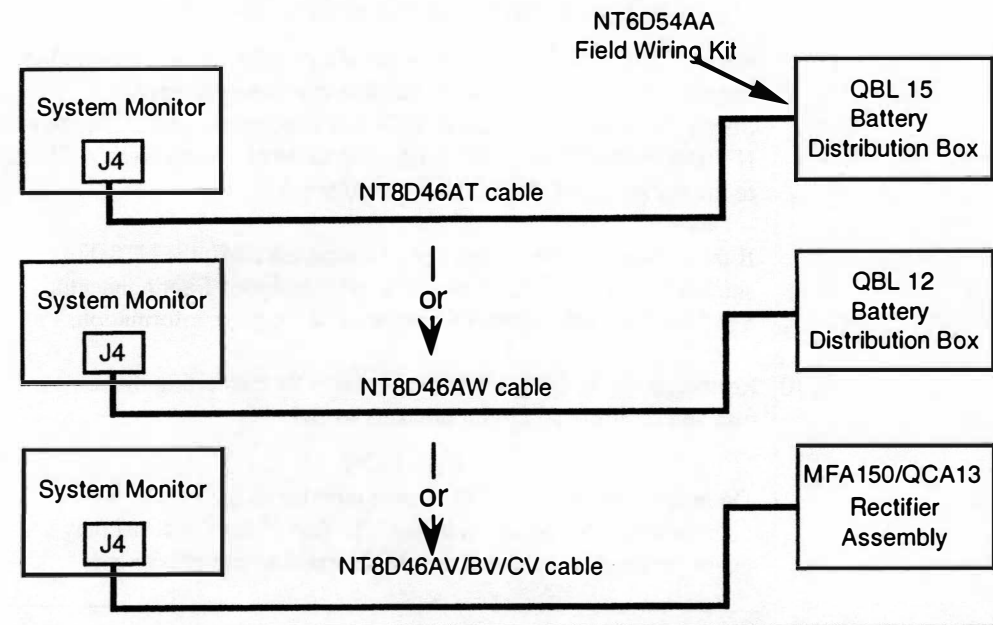
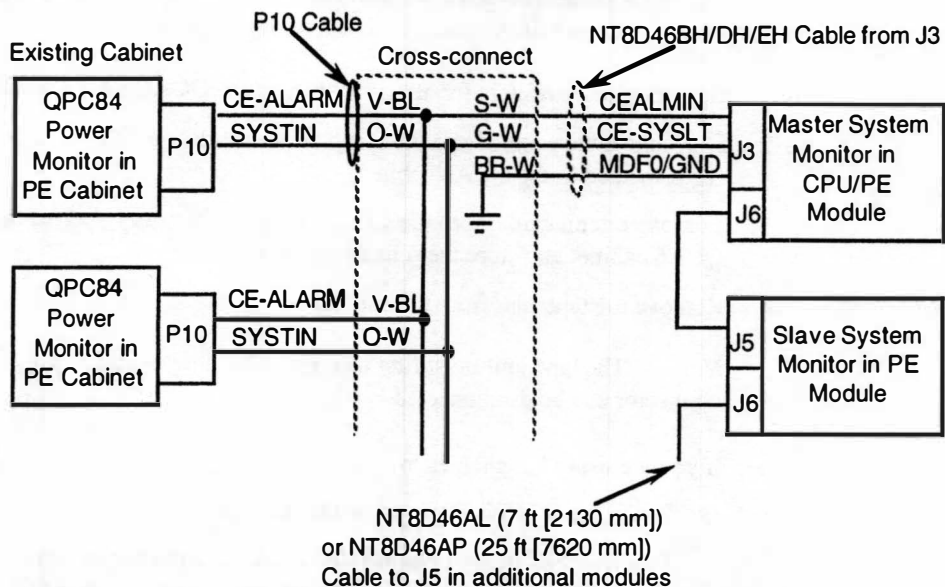


Figure 1-10**Connecting alarm cables between a cabinet and a column**

Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

Removing equipment no longer required

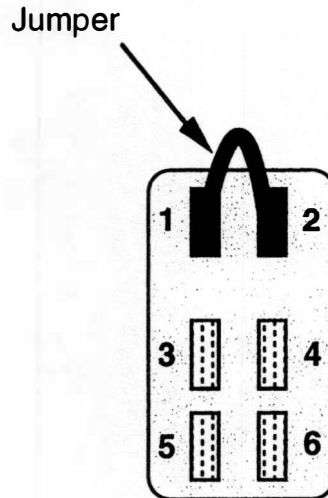
The following procedure describes how to remove the equipment that is no longer required once the Option 21E is operating normally.

- 1 Set the circuit breakers for all the shelves in the QCA6 cabinet to OFF.
- 2 Disconnect the cables from the faceplate connectors on all the circuit cards located in the QCA6 cabinet.
- 3 Remove circuit cards from the CE, network and memory shelves in the QCA6 cabinet and store them in a safe place.
- 4 Remove the tape unit from the cabinet.

Note: The tape unit must first be removed before the tape unit connector can be disconnected.

- 5 If you are using CE shelves for DTI/PRI cards:
 - Install the DTI/PRI cards in available card slots.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the CPU/Network module of the Option 21 upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breakers for the CE shelves to ON.
- 6 If you are not going to use the CE shelf for DTI/PRI cards:
 - Disconnect harness alarm and power connections from the CE shelves.
 - Unplug all remaining circuit cards from the CE shelves.
 - Disconnect and remove the cooling unit. Place a jumper (a piece of 24 or 26 AWG bare wire or a paper clip can be used) across power monitor leads 1 and 2 of the cooling unit power connector as shown in Figure 1-11. This disables the alarm for the removed cooling unit.

Figure 1-11
Cooling unit alarm connection



Cooling unit connector on
cabinet power distribution harness

SL-1 QCA23 cabinet upgrade to Meridian 1 Option 21E

This procedure is used to upgrade an SL-1 QCA23 cabinet (LE, N, ST or 21) to Meridian 1 Option 21E. To upgrade to a Meridian 1 Option 21E system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 21E:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 21E operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 21E is operating with the new software provided with the Option 21E.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 21E operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Hardware upgrade methods

There are two methods of upgrading a QCA23 cabinet to a Meridian 1 Option 21E:

- 1 If the CPU shelf has been previously upgraded to a QSD81 (ST or 21) then either the card level or modular upgrade may be performed.
- 2 If the CPU shelf has not been previously upgraded to a QSD81 then a modular upgrade must be done.

Card upgrade of an SL-1 QCA23 cabinet (ST or 21) to Meridian 1 Option 21E

Table 2-1 lists minimum hardware requirements needed for a card level upgrade of a QCA23 cabinet to a Meridian 1 Option 21E.

Table 2-1
Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT9D47AB	EMSI to SMDU Data Cable, 2 ft (610mm)
	1	NT9D47AD	EMSI to SMDU Data Cable, 6 ft (1830mm)
1	1	NT9D66AB	EMSI to SMDU Power Cable, 2 ft (610mm)
	1	NT9D66AD	EMSI to SMDU Power Cable, 6 ft (1830mm)
1	1	NT9D33AA	Small System Multi-Drive Unit (SMDU)
1	1	NT9D34AA	Enhanced Multi-Drive System Interface (EMSI)
1	1	NTND01CA	12MB CPU/Memory Card
1	1	NTND02BA Rls 2	Misc, Dual SDI Peripheral Signaling Pack with Battery (MSPS)
1	1	NTND31AA Rls 3	Daughter board (ROM)

Note: The vintages shown on circuit cards in Table 2-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

Summary of steps to upgrade

Upgrading consists of:

- removal of CPU/MEM, PS, FDI and FDU
- installation of Option 21E cards and cables
- sysload

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

Removal of CPU/MEM, PS, FDI and FDU

To remove cards:

- 1 Remove software disks from the Floppy Disk Unit.
- 2 Disconnect the cable from the faceplate of the FDI and FDU.
- 3 Set the ENB/DIS switches on cards located in slots 1, 2, 3 and 4 to DIS.
- 4 Remove the Floppy Disk Unit and cards located in slots 1, 2, 3 and 4.

Installation of Option 21E equipment

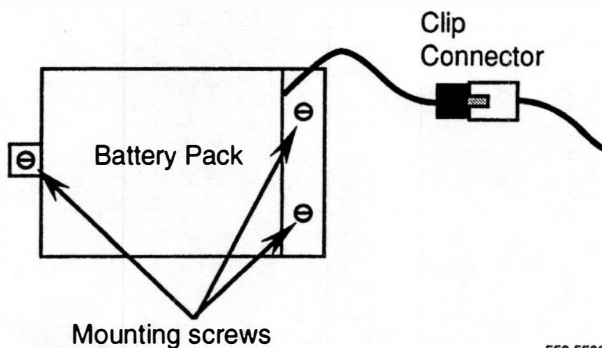
To install Option 21E cards and cables:

- 1 Set the ENB/DIS switch on the NT9D34 EMSI card to DIS.
- 2 Mount the appropriate software cartridge on the EMSI card and set option switches 1, 5, 7 and 8 to ON.
- 3 Install EMSI card in card slot 3 and set the ENB/DIS switch to ENB.
- 4 Install the NTND31AA ROM card onto the NTND01CA CPU/Memory card:
 - Carefully plug the ROM card into the pin connector.
 - Install the screw and washer at each corner of the ROM card.
- 5 Install the CPU/Memory card in card slot 2.
- 6 Set the ENB/DIS switch on the MSPS card to DIS.
- 7 Set option switches on the MSPS card to activate SDI ports. To avoid conflicting addresses, determine the appropriate option switch settings, refer to *Circuit card installation and testing* (553-3001-211).

- 8 Connect the battery pack on the NTND02BA MSPS card by plugging the battery clip connector to the clip connector on the board as illustrated in Figure 2-1.

Note: The battery will not be fully charged until 24 hours after installation in a powered system.

Figure 2-1
Battery pack connection to the MSPS



553-5566

- 9 Install the NTND02BA MSPS card in slot 4.
- 10 Connect the NTND37 Dual SDI cable to the connector on the NTND02BA MSPS faceplate.
- 11 Set the ENB/DIS switch on the NTND02BA MSPS card to ENB.
- 12 Install the NT9D33 SMDU in its assigned position in the CE shelf. The SMDU may be installed in an alternate location such as the old network shelf in position 6 or any available PE slots, provided the NT9D47 and NT9D66 interface cables will reach from the SMDU to the EMSI.

Note: If the Floppy Drive is to be located within two slot spaces of the QPC355 Converter the shield (PO677761) must be installed between them.

Sysload

Before you sysload the system, review installation steps and verify that all circuit cards are in the appropriate card slots, ENB/DIS switches are set to ENB, and all cables are properly connected.

- 1 To sysload the system insert the floppy disks into disk drives and press Rld on the CPU/MEM card.
- 2 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Modular upgrade of an SL-1 QCA23 cabinet (LE, N, ST or 21) to Meridian 1 Option 21E

Equipment required

Table 2-2 lists minimum hardware requirements needed to upgrade a QCA23 cabinet to a Meridian 1 Option 21E.

Table 2-2

Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT6D43AA or NT7D04AA RIs 3	CE/PE power supply DC
		NT7D00AA	Top cap AC
1	1	NT7D00BA RIs 2	Top cap DC
	1	NT7D09CA	Pedestal DC
1		NT7D14AA or NT8D29AA RIs 4	CE/PE power supply AC
1		NT8D11AB RIs 2	CE/PE module AC
	1	NT8D11DC	CE/PE module DC
1		NT8D27AB RIs 3	Pedestal AC
1	1	NT8D22AC	System monitor
1		NT8D52AA	Pedestal blower unit AC
	1	NT8D52DC	Pedestal blower unit DC (DC system)
1		NT8D53AB RIs 5	Power distribution AC
-continued-			

Table 2-2 (continued)
Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT8D17AA Rls 9	Conference/TDS circuit card
1	1	NT8D18AA Rls 9	Digitone Receiver Network card
1	1	NT8D41AA Rls 2	2 Port SDI Paddle Board
1	1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	1	NT8D46AL	System monitor serial link cable
1	1	NT8D46BH	System monitor to SDI cable
1	1	NT8D82	MSPS to I/O cable
3	3	NT8D84AA	SDI Paddle Board to I/O Cable
1	1	NT8D95AJ	SDI I/O panel to DTE/DCE, 16 ft (4875 mm)
1	1	NT9D33AA	Small System Multi-Drive Unit (SMDU)
1	1	NT9D34AA	Enhanced Multi-Drive System Interface (EMSI)
1	1	NT9D47AB	EMSI to SMDU Data Cable, 2 ft (610mm)
	1	NT9D47AD	EMSI to SMDU Data Cable, 6 ft (1830mm)
1	1	NT9D66AB	EMSI to SMDU Power Cable, 2 ft (610mm)
	1	NT9D66AD	EMSI to SMDU Power Cable, 6 ft (1830mm)
1	1	NTND01CA	12MB CPU/Memory Card
1	1	NTND02BA Rls 2	Misc, Dual SDI Peripheral Signaling Pack with Battery (MSPS)
1	1	NTND31AA Rls 3	ROM daughter board
1	1	NTND37AA	MSPS I/O to DTE/DCE cable 8 ft (2440 mm)
1	1	QPC84Q	Power Monitor

Note: The vintages shown on circuit cards in Table 2-2 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA23 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 21E Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 21E to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 21E to the existing cabinet.
- A second NT8D86 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Note: The second NT8D86 cable is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as a QCA7 or 8) do not require the second NT8D86 cable since the NT8D73 cable can be connected directly to the Peripheral Buffer connector. For existing cabinets equipped to suppress EMI, refer to 553-3001-150, *Upgrade Engineering*.

Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 21E system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 2-2 shows a typical QCA23 cabinet and Figure 2-3 shows a QCA23 cabinet that has been upgraded to Meridian 1 Option 21E.

Figure 2-2
Typical QCA23 cabinet

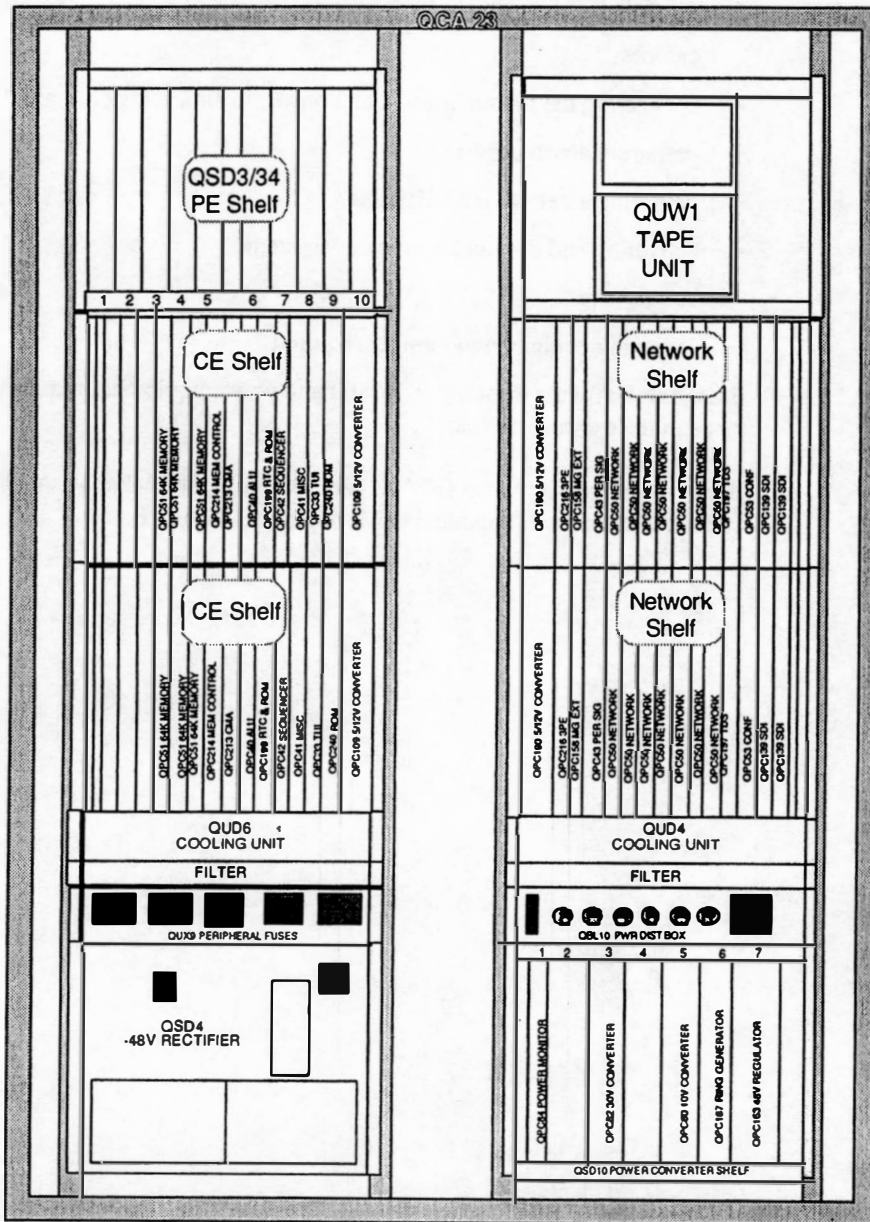
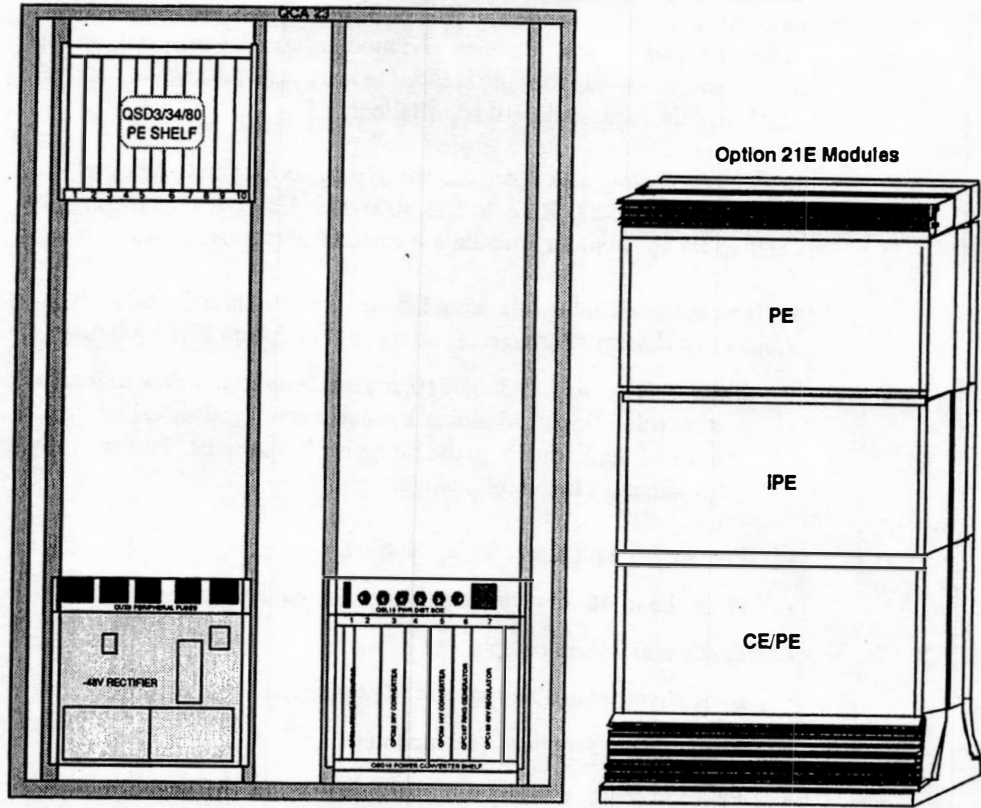


Figure 2-3

Typical QCA23 cabinet that has been upgraded to Meridian 1 Option 21E



Installing the Meridian 1 Option 21E system

The Option 21E equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, CPU/Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 21E equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 2-3 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.
- Install cabling:
 - Cable common equipment

- Cable network loops (within the Option 21E columns only).

Note: Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.

- Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 21E equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 2-4 shows Option 21E circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 2-3
NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 2-3 (continued)
NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 2-3 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves				Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."					
For each slave, indicates the slave address				Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."					
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master			on					
	slave			off					
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

Table 2-3 (continued)
NT8D22 system monitor — settings for total number of slaves — SW2 on master

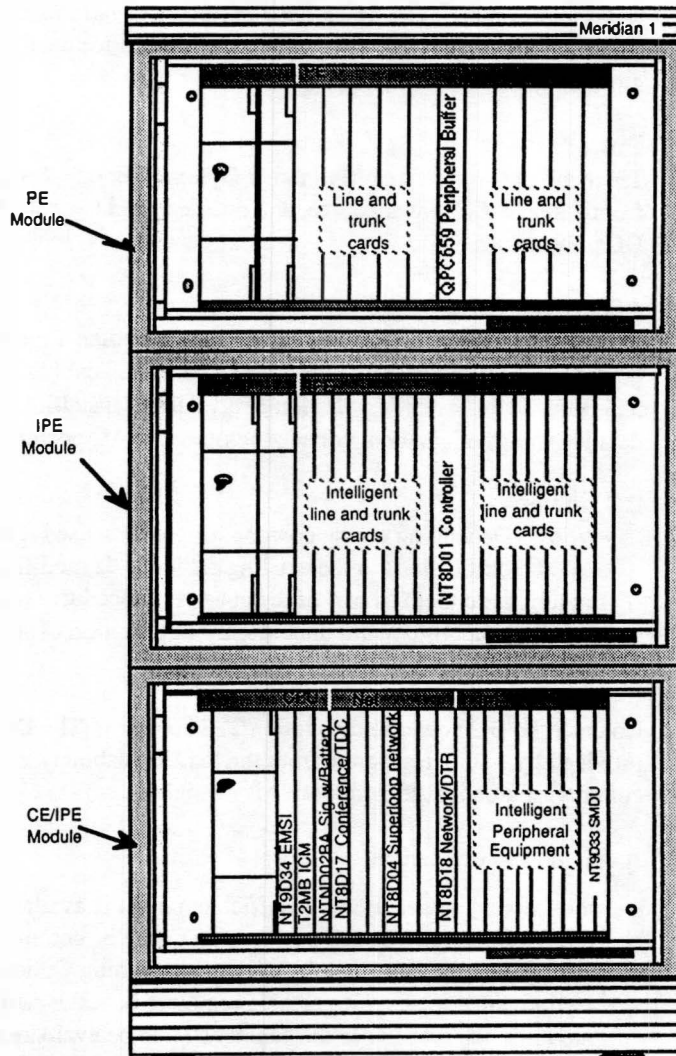
How many slave units		Switch position						How many slave units		Switch position					
		3	4	5	6	7	8			3	4	5	6	7	8
0		on	on	on	on	on	on	32		off	on	on	on	on	on
1		on	on	on	on	on	off	33		off	on	on	on	on	off
2		on	on	on	on	off	on	34		off	on	on	on	off	on
3		on	on	on	on	off	off	35		off	on	on	on	off	off
4		on	on	on	off	on	on	36		off	on	on	off	on	on
5		on	on	on	off	on	off	37		off	on	on	off	on	off
6		on	on	on	off	off	on	38		off	on	on	off	off	on
7		on	on	on	off	off	off	39		off	on	on	off	off	off
8		on	on	off	on	on	on	40		off	on	off	on	on	on
9		on	on	off	on	on	off	41		off	on	off	on	on	off
10		on	on	off	on	off	on	42		off	on	off	on	off	on
11		on	on	off	on	off	off	43		off	on	off	on	off	off
12		on	on	off	off	on	on	44		off	on	off	off	on	on
13		on	on	off	off	on	off	45		off	on	off	off	on	off
14		on	on	off	off	off	on	46		off	on	off	off	off	on
15		on	on	off	off	off	off	47		off	on	off	off	off	off
16		on	off	on	on	on	on	48		off	off	on	on	on	on
17		on	off	on	on	on	off	49		off	off	on	on	on	off
18		on	off	on	on	off	on	50		off	off	on	on	off	on
19		on	off	on	on	off	off	51		off	off	on	on	off	off
20		on	off	on	off	on	on	52		off	off	on	off	on	on
21		on	off	on	off	on	off	53		off	off	on	off	on	off
22		on	off	on	off	off	on	54		off	off	on	off	off	on
23		on	off	on	off	off	off	55		off	off	on	off	off	off
24		on	off	off	on	on	on	56		off	off	off	on	on	on
25		on	off	off	on	on	off	57		off	off	off	on	on	off
26		on	off	off	on	off	on	58		off	off	off	on	off	on
27		on	off	off	on	off	off	59		off	off	off	on	off	off
28		on	off	off	off	on	on	60		off	off	off	off	on	on
29		on	off	off	off	on	off	61		off	off	off	off	on	off
30		on	off	off	off	off	on	62		off	off	off	off	off	on
31		on	off	off	off	off	off	63		off	off	off	off	off	off
— continued —															

Table 2-3 (continued)

NT8D22 system monitor — slave address — SW2 on slave

Slave unit address Position							Slave unit address Position						
	3	4	5	6	7	8		3	4	5	6	7	8
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
32	off	on	on	on	on	on							

Figure 2-4
Meridian 1 Option 21E CPU/IPE module with IPE and PE modules



Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 21E: one designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 21E, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Note: Depending on the power configuration used it may be required to do modifications to the existing cabinets. If modifications are required, do them as part of the cut-over procedures (described later in this document) to avoid unnecessary interruption of service to the end users.

Connect the DC power to the Option 21E columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 21E equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 21E module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 21E modules.

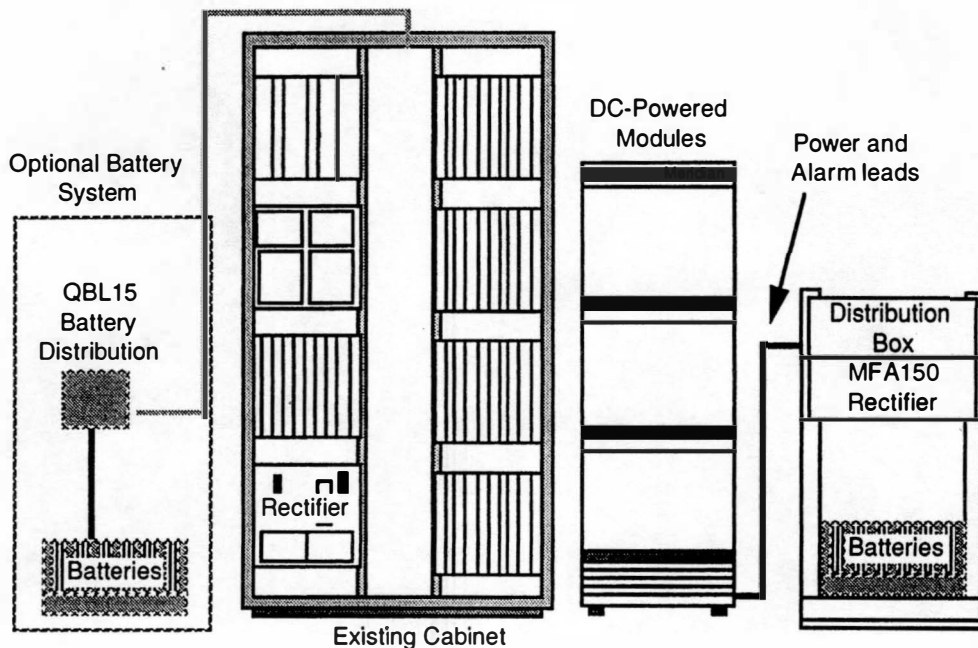
- a new power source installed in conjunction with the Option 21E.

To determine the power requirements for the Option 21E system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 2-5 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 21E modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 21E column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 2-5
Typical arrangement of independently DC-powered Meridian 1 Option 21E modules



Note: An MFA150 cannot share a battery string connected to QBL15, QBL12 or QCA13. A separate battery string is required for the MFA150.

Common power source

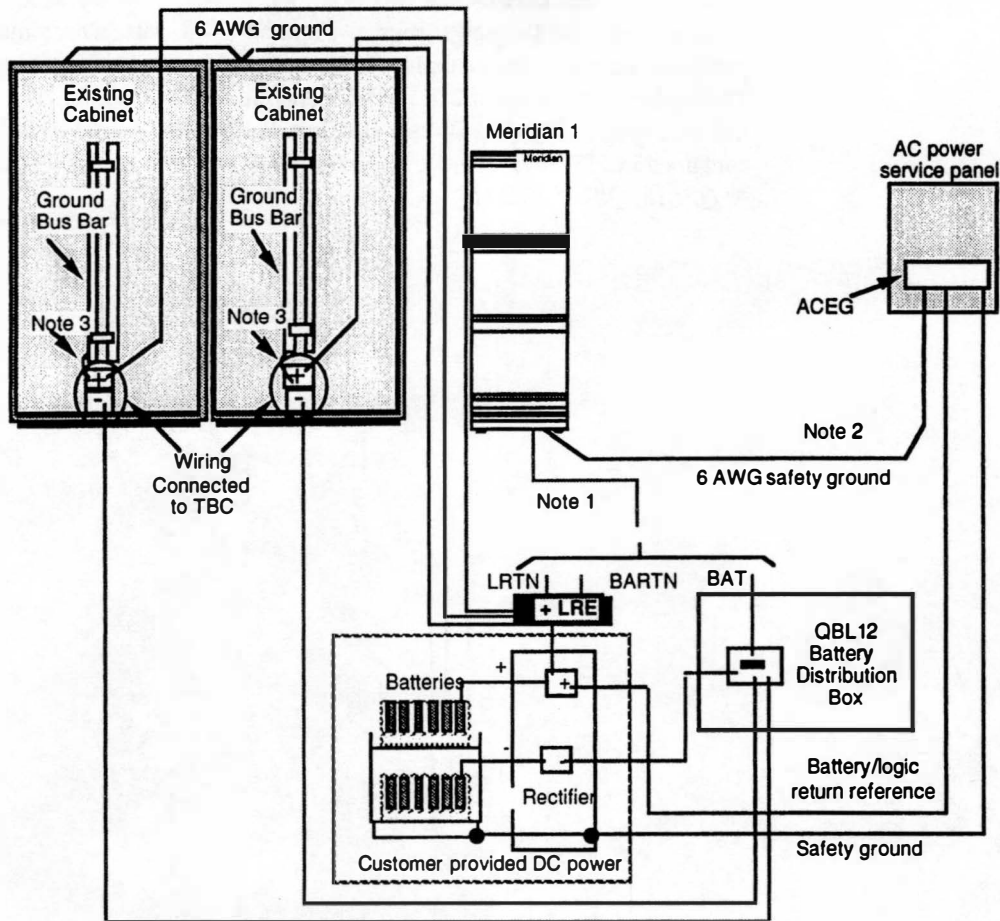
Existing cabinet rectifier as a common power source

- When the existing cabinet DC power source is used as a common power source for the cabinet and the column, any QSD4 rectifier will have to be replaced with a QRF8 rectifier and the existing battery distribution box will have to be replaced with a QBL15 battery distribution box. For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 2-6 illustrates a common power supply arrangement for the upgraded system. This includes both Option 21E modules and the existing cabinet. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

Customer provided power as a common power source

- A QBL12 Battery Distribution Box is normally used to connect to a customer provided DC power source. Figure 2-7 illustrates a customer provided common power supply arrangement for the upgraded system. This includes both Option 21E modules and the existing cabinet. A full description of QBL12 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 2-7
Typical arrangement using a customer provided common DC power supply



Note 1: DC power feeds. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

Note 2: With customer provided power equipment, the Meridian 1 frame requires a direct connection to the ACEG. In addition, the positive bus bar in the customer provided equipment must connect to the ACEG.

Note 3: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

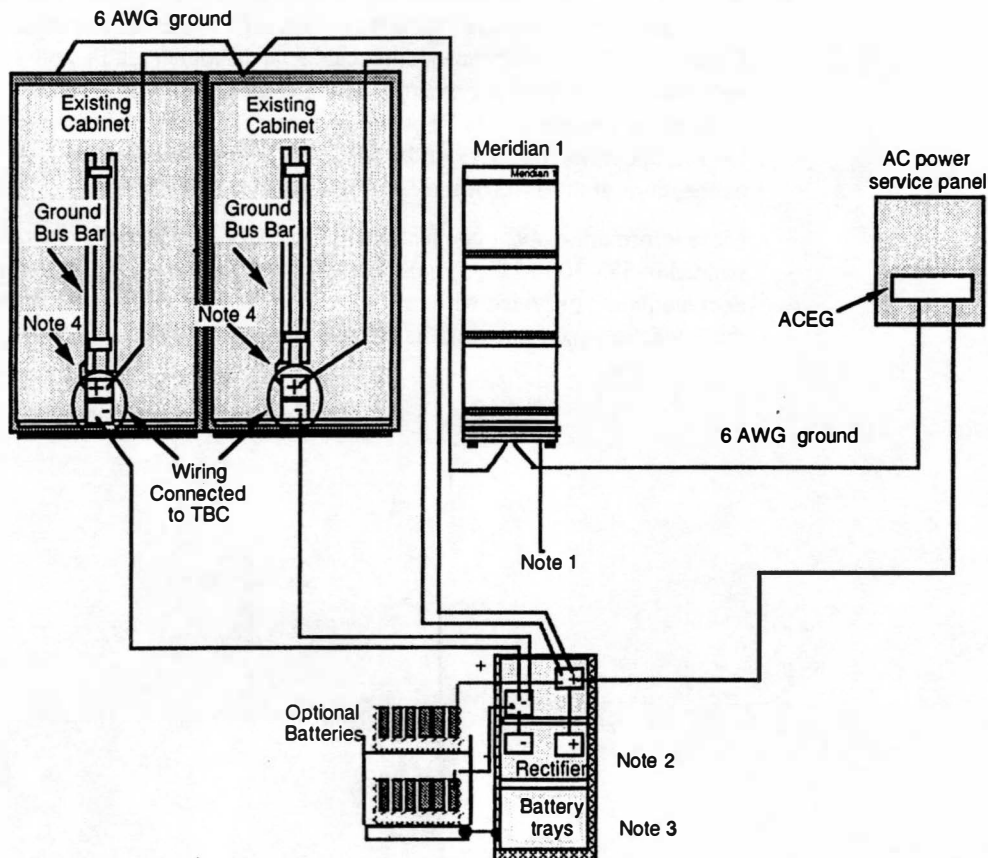
At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

An MFA150 power system as a common power source

- An MFA150 power system assembly can be used as a common power source for both the Option 21E and the existing cabinets as shown in Figure 2-8. To connect the existing cabinets, disconnect the + and - 48V power leads from the existing power source, then reroute and connect them to the MFA150 power system. The connections are located under the top cover of the MFA150 power system. The connections at the TBC of the existing cabinet do not change.
- More information about connections for the MFA150 power system is located in 553-3001-210, *System installation procedures*. Refer to the documentation provided with the existing system for information about disconnecting and removing the old rectifier and batteries.

Figure 2-8

Typical arrangement using an MFA150 power system as a common power source



Note 1: DC power feeds from the MFA150 to the Meridian 1. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

Note 2: The MFA150 power system may be equipped with one or two power shelves for a maximum of 75 amps or 150 amps respectively.

Note 3: Batteries may be installed in two optional battery trays located under the rectifier shelves.

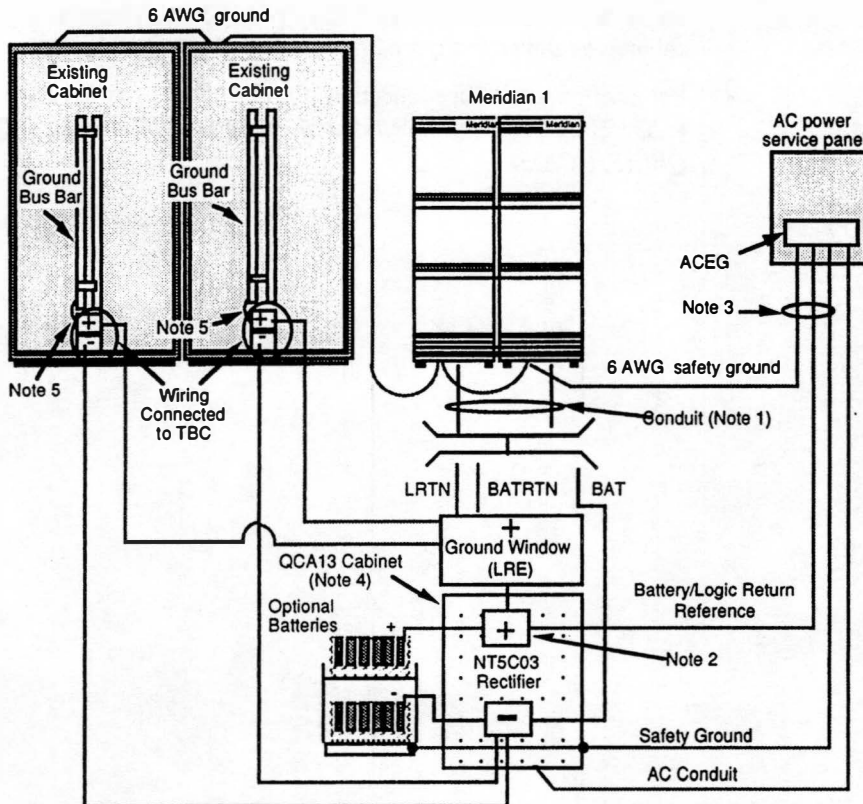
Note 4: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

An existing QCA13 power cabinet as a common power source

- A QCA13 power cabinet equipped with rectifiers can be used as a common power source for both the Option 21E and the existing cabinets as shown in Figure 2-9.
- For information about connections for the QCA13 power cabinet, refer to 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 2-9
Typical arrangement using a QCA13 as a common power source



Note 1: DC power feeds to Meridian 1 pedestals. Each feed consists of two BAT (-), two BATRTN (+), and one LRTN (+) conductors. If required, conductors can be run in conduit as shown. BAT (-) connects to the appropriate fuse in the rectifier cabinet.

Note 2: The QCA13 cabinet does not contain a bus for terminating individual battery and logic returns. A ground window should be used to consolidate all battery and logic returns.

Note 3: The Battery/Logic Return Reference wiring and the safety ground wiring must be #6 AWG, minimum.

Note 4: Up to four NT5C03 rectifiers can be equipped in a QCA13 cabinet for a total of 200 amps.

Note 5: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 21E modules.

These cables connect the System Monitor to the SDI Paddle Board in the CPU/Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section '**Separate power source**' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 2-10) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12 or QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 21E system:

- 1 Power up and initially load the Option 21E column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.

- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
- 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
- 4 The Meridian 1 Option 21E system is now operational.

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 21E column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 Connect an NT8D86 cable between the connector on the faceplate of the network card and the I/O panel of the Option 21E. One cable is required for each network loop.
- 2 Connect an NT8D73 shielded cable, up to 30 ft (9 m) in length, to the connector on the I/O panel of the Option 21E. Route the NT8D73 cable to the existing cabinet. Do not connect it to the Peripheral Buffer card in the existing cabinet at this time.

Note: Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

- 3 If required in the existing cabinet (see Note) connect an NT8D86 cable to the connector on the NT8D73 shielded cable from the Option 21E. Make sure that the connectors are locked together with the locking devices. Do not connect the cable to the faceplate of the Peripheral Buffer card at this time. It will be connected as part of the cutover procedure.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable.

Cutting-over

The following procedure describes how to cut-over to the Option 21E system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL12 or QCA13 unit**
Remove the fuses from the -48V fuse panel corresponding to each cabinet and column.
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.

Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.

- **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
 - **AC powered modules**
Set the AC power supply breaker at the AC power service panel to OFF.
- 2 If required, perform power modifications to the existing cabinets.
 - 3 In the existing cabinets, remove the wiring connecting the frame of the cabinet to the positive (+) connection of the TBC, and the wiring connecting the frame to the cabinet ground bus bar. Refer to Figures 2-5 through 2-7.

Note: This wiring was factory installed. It must be removed to avoid ground loops when existing cabinets are used with Meridian 1 modules.

- 4 This step applies only to Meridian 1 modules connected to a DC power source.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 2-10) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
 - the QBL12 or QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.
- 5 This step applies only if a new common power source with battery backup connected to a QBL12, QBL15 or QCA13 battery distribution box is to be used.

Note: This step does not apply if the common power source uses an MFA150 rectifier.

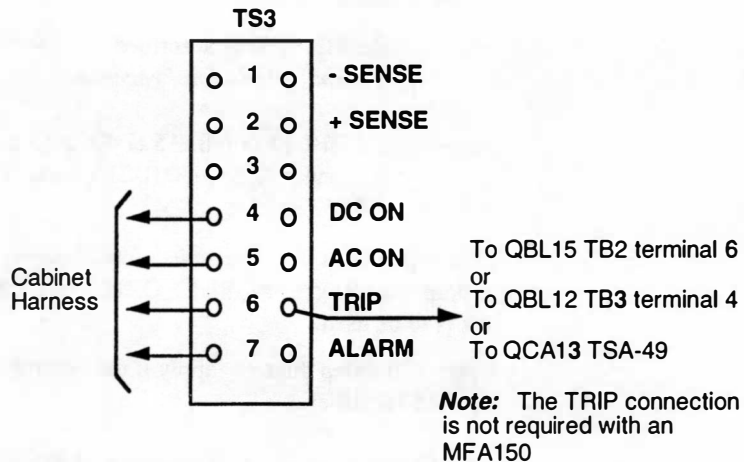
A TRIP lead must be connected to the TRIP connection on:

- the TRIP terminal on the terminal strip on the rectifier in existing cabinets equipped with a rectifier.
- the TRIP terminal of TS3 in existing cabinets not equipped with a rectifier.

The TRIP leads must be connected as follows.

If the existing rectifier is being removed from the cabinet, make the following wiring changes.

- a) If not already connected to TS3, tag and move the cabinet harness DC ON, AC ON, TRIP and ALARM leads presently connected on the rectifier to TS3 as shown in the above drawing. Depending on the type of existing cabinet, the TS3 is located either on the cabinet's TBC block, or on the QUT3 power unit.



- b) Install and connect a 16 AWG wire from terminal 6 (TRIP) on TS3 to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connections in each cabinet with 16 AWG wire.
- c) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.

Note: The DC ON, AC ON and ALARM lead functions are performed by the Meridian 1 module. Leaving these leads connected in the existing cabinets only extends the alarm indicators to the QPC84 power monitors. If you wish, you may leave these leads disconnected. However, the TRIP lead must be connected.

If the existing rectifier is to remain in the cabinet, make the following wiring changes.

- a) Install and connect a 16 AWG wire from the TRIP connection on the terminal strip of the rectifier to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connection on the terminal strip of the rectifier in each cabinet with 16 AWG wire. In existing cabinets not equipped with a rectifier (such as a QCA7 cabinet powered by a QCA8 cabinet), 'daisy chain' to the TRIP connection on TS3.
 - b) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.
- 6 Cross-connect the alarm cables as shown in Figure 2-11.
 - 7 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.
 - 8 Connect the NT8D86 cables (if provided) or NT8D73 shielded network cables from the Option 21E to the connector on the faceplate of the Peripheral Buffer circuit card in the existing cabinets.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable. The NT8D73 shielded cable can be connected directly to the connector of the Peripheral Buffer card.

—OR—

If the existing cabinet is equipped to suppress EMI, the NT8D73 shielded cable should be connected to its assigned filter connector. See 553-3001-150, *Upgrade Engineering* for more information.

- 9 Remove the QPC84 Power Monitor from the QCA23 cabinet and set switch C1 1, position 2 to ON. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required. Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.

Note: Disregard any remaining alarm indications. Alarm indications should return to normal once the upgrade is completed and equipment that is no longer required has been removed as described later in this chapter.

- 10 Restore power to the cabinets and column by reinserting the removed fuse and resetting all circuit breakers to ON.

CAUTION

Do not remove the NT8D22 system monitor (XSM) from the column while the system is in service. Removing the XSM may cause the input circuit breakers on the existing cabinets to trip.

- 11 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Figure 2-10
NT8D46 cable types

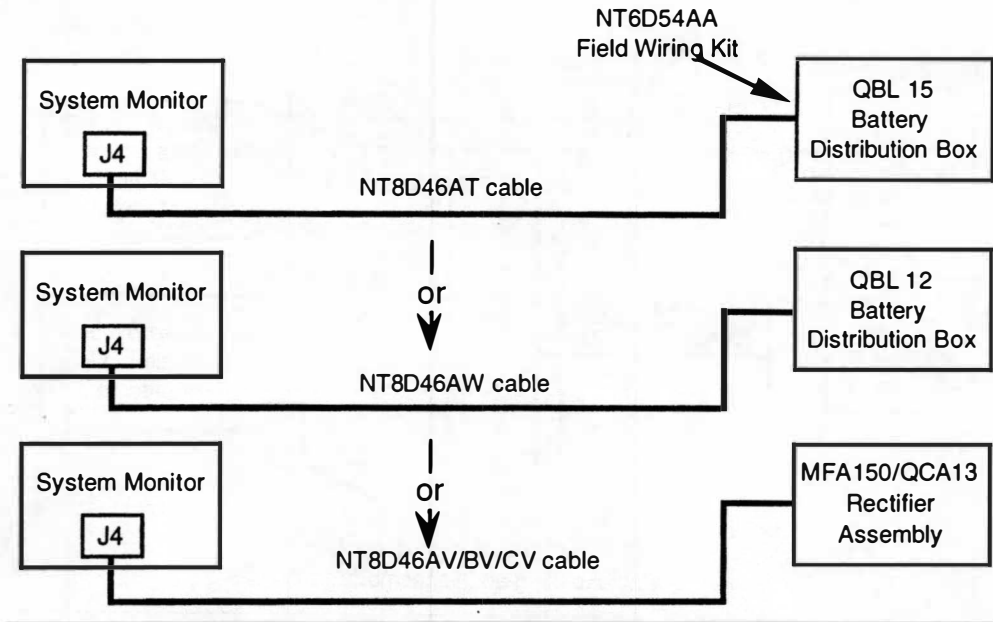
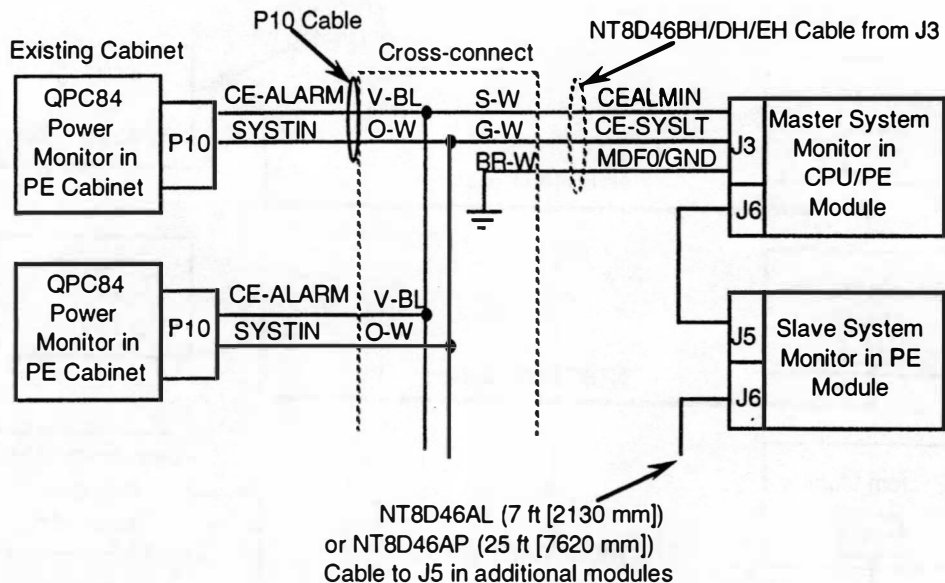


Figure 2-11
Connecting alarm cables between a cabinet and a column



Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

Removing equipment no longer required

The following procedure describes how to remove the equipment that is no longer required once the Option 21E is operating normally.

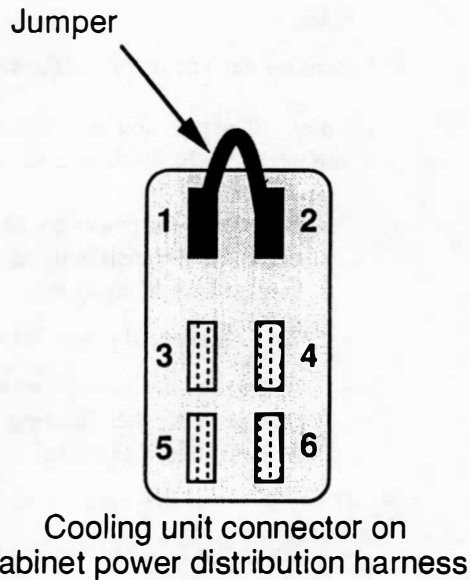
- 1 Set circuit breakers CPU0, NET0, CPU1 and NET1 on the QBL10 power distribution box in the QCA23 cabinet to OFF.
- 2 Disconnect cables from the faceplate connectors on circuit cards located in the CPU/MEM and Network shelves.
- 3 Remove CE circuit cards from the CE shelf and store them in a safe place.
- 4 Remove the tape unit from the cabinet.

Note: The tape unit must first be removed before the tape unit connector can be disconnected.

- Disconnect the power connector from the cabinet power wiring harness to the shelf housing the tape unit or QMM38 Mass Storage Unit, if equipped.
 - Tape all exposed power leads with electrical insulation tape.
 - Disconnect the power connector from the cabinet power wiring harness to the shelf housing the tape unit or QMM38 Mass Storage Unit, if equipped.
- 5 If you are using the main CE shelf for DTI/PRI cards:
 - Install the DTI/PRI cards in CE shelves.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the CPU/Network module of the Option 21E upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breakers CPU0, NET0, CPU1 and NET1 on the QBL10 power distribution box to ON.
 - 6 If you are not going to use the CE shelf for DTI/PRI cards:
 - Disconnect alarm connectors from the CE shelves.
 - Unplug all power converter cards the shelves.

- Disconnect and remove the QUD4 and QUD6 cooling units. Place a jumper (a piece of 24 or 26 AWG bare wire or a paper clip can be used) across power monitor leads 1 and 2 of the cooling unit power connector as shown in Figure 2-12. This disables the alarm for the removed cooling unit.

Figure 2-12
Cooling unit alarm connection



SL-1 QCA28 cabinet upgrade to Meridian 1 Option 21E

This procedure is used to upgrade an SL-1 QCA28 cabinet (A, ST or 21) to Meridian 1 Option 21E. To upgrade to a Meridian 1 Option 21E system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 21E:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 21E operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 21E is operating with the new software provided with the Option 21E.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 21E operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Hardware upgrade methods

There are two methods of upgrading a QCA28 cabinet to a Meridian 1 Option 21E:

- 1 If the CPU shelf has been previously upgraded to a QSD81 (ST or 21) then either the card level or modular upgrade may be performed.
- 2 If the CPU shelf has not been previously upgraded to a QSD81 then a modular upgrade must be done.

Card upgrade of an SL-1 QCA28 cabinet (ST or 21) to Meridian 1 Option 21E

Equipment required

Table 3-1 lists minimum hardware requirements needed for a card level upgrade of a QCA28 cabinet to a Meridian 1 Option 21E.

Table 3-1
Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT9D33AA	Small System Multi-Drive Unit (SMDU)
1	1	NT9D34AA	Enhanced Multi-Drive System Interface (EMSI)
1	1	NT9D47AB	EMSI to SMDU Data Cable, 2 ft (610mm)
	1	or NT9D47AD	EMSI to SMDU Data Cable, 6 ft (1830mm)
1	1	NT9D66AB	EMSI to SMDU Power Cable, 2 ft (610mm)
1	1	or NT9D66AD	EMSI to SMDU Power Cable, 6 ft (1830mm)
1	1	NTND01CA	12MB CPU/Memory Card
1	1	NTND02BA Rls 2	Misc, Dual SDI Peripheral Signaling Pack with Battery (MSPS)
1	1	NTND31AA Rls 3	Daughter board (ROM)

Note: The vintages shown on circuit cards in Table 3-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

Summary of steps to upgrade

Upgrading consists of:

- removal of CPU/MEM, PS, FDI and FDU
- installation of Option 21E cards and cables
- sysload

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

Removal of CPU/MEM, PS, FDI and FDU

To remove cards:

- 1 Remove software disks from the Floppy Disk Unit.
- 2 Disconnect the cable from the faceplate of the FDI and FDU.
- 3 Set the ENB/DIS switches on cards located in slots 1, 2, 3 and 4 to DIS.
- 4 Remove the Floppy Disk Unit and cards located in slots 1, 2, 3 and 4.

Installation of Option 21E equipment

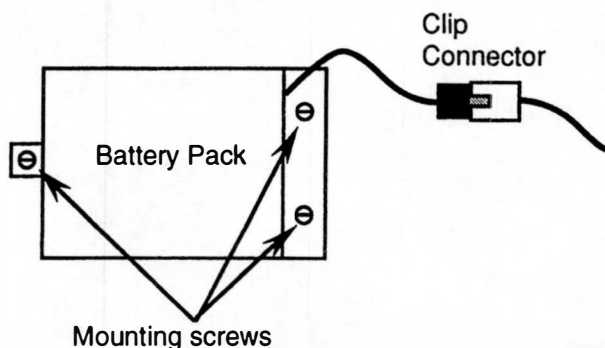
To install Option 21E cards and cables:

- 1 Set the ENB/DIS switch on the NT9D34 EMSI card to DIS.
- 2 Mount the appropriate software cartridge on the EMSI card and set option switches 1, 5, 7 and 8 to ON.
- 3 Install EMSI card in card slot 3 and set the ENB/DIS switch to ENB.
- 4 Install the NTND31AA ROM card onto the NTND01CA CPU/Memory card:
 - Carefully plug the ROM card into the pin connector.
 - Install the screw and washer at each corner of the ROM card.
- 5 Install the CPU/Memory card in card slot 2.
- 6 Set the ENB/DIS switch on the MSPS card to DIS.
- 7 Set option switches on the MSPS card to activate SDI ports. To avoid conflicting addresses, determine the appropriate option switch settings, refer to *Circuit card installation and testing* (553-3001-211).

- 8 Connect the battery pack on the NTND02BA MSPS card by plugging the battery clip connector to the clip connector on the board as illustrated in Figure 3-1.

Note: The battery will not be fully charged until 24 hours after installation in a powered system.

Figure 3-1
Battery pack connection to the MSPS



553-5566

- 9 Install the NTND02BA MSPS card in slot 4.
- 10 Connect the NTND37 Dual SDI cable to the connector on the NTND02BA MSPS faceplate.
- 11 Set the ENB/DIS switch on the NTND02BA MSPS card to ENB.
- 12 Install the NT9D33 SMDU in its assigned position in the CE shelf. The SMDU may be installed in an alternate location such as the old network shelf in position 6 or any available PE slots, provided the NT9D47 and NT9D66 interface cables will reach from the SMDU to the EMSI.

Sysload

Before you sysload the system, review installation steps and verify that all circuit cards are in the appropriate card slots, ENB/DIS switches are set to ENB, and all cables are properly connected.

- 1 To sysload the system insert the floppy disks into disk drives and press Rld on the CPU/MEM card.
- 2 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Modular upgrade of an SL-1 QCA28 cabinet (A, ST or 21) to Meridian 1 Option 21E

Equipment required

Table 3-2 lists minimum hardware requirements needed to upgrade a QCA28 cabinet to a Meridian 1 Option 21E.

Table 3-2

Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT6D43AA or NT7D04AA Rls 3	CE/PE power supply DC
		NT7D00AA	Top cap AC
	1	NT7D00BA Rls 2	Top cap DC
	1	NT7D09CA	Pedestal DC
1		NT7D14AA or NT8D29AA Rls 4	CE/PE power supply AC
1		NT8D11AB Rls 2	CE/PE module AC
	1	NT8D11DC	CE/PE module DC
1		NT8D27AB Rls 3	Pedestal AC
1	1	NT8D22AC	System monitor
1		NT8D52AA	Pedestal blower unit AC
	1	NT8D52DC	Pedestal blower unit DC (DC system)
1		NT8D53AB Rls 5	Power distribution AC
-continued-			

Table 3-2 (continued)

Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT8D17AA Rls 9	Conference/TDS circuit card
1	1	NT8D18AA Rls 9	Digitone Receiver Network card
1	1	NT8D41AA Rls 2	2 Port SDI Paddle Board
1	1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	1	NT8D46AL	System monitor serial link cable
1	1	NT8D46BH	System monitor to SDI cable
1	1	NT8D82	MSPS to I/O cable
3	3	NT8D84AA	SDI Paddle Board to I/O Cable
1	1	NT8D95AJ	SDI I/O panel to DTE/DCE, 16 ft (4875 mm)
1	1	NT9D33AA	Small System Multi-Drive Unit (SMDU)
1	1	NT9D34AA	Enhanced Multi-Drive System Interface (EMSI)
1	1	NT9D47AB	EMSI to SMDU Data Cable, 2 ft (610mm)
	1	or NT9D47AD	EMSI to SMDU Data Cable, 6 ft (1830mm)
1	1	NT9D66AB	EMSI to SMDU Power Cable, 2 ft (610mm)
1	1	or NT9D66AD	EMSI to SMDU Power Cable, 6 ft (1830mm)
1	1	NTND01CA	12MB CPU/Memory Card
1	1	NTND02AB Rls 2	Misc, Dual SDI Peripheral Signaling Pack with Battery (MSPS)
1	1	NTND31AA Rls 3	ROM daughter board
1	1	NTND37AA	MSPS I/O to DTE/DCE cable 8 ft (2440 mm)
1	1	QPC84Q	Power Monitor

Note: The vintages shown on circuit cards in Table 3-2 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA28 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 21E Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 21E to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 21E to the existing cabinet.
- A second NT8D86 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Note: The second NT8D86 cable is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as a QCA7 or 8) do not require the second NT8D86 cable since the NT8D73 cable can be connected directly to the Peripheral Buffer card. For existing cabinets equipped to suppress EMI, refer to 553-3001-150, *Upgrade Engineering*.

Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 21E system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

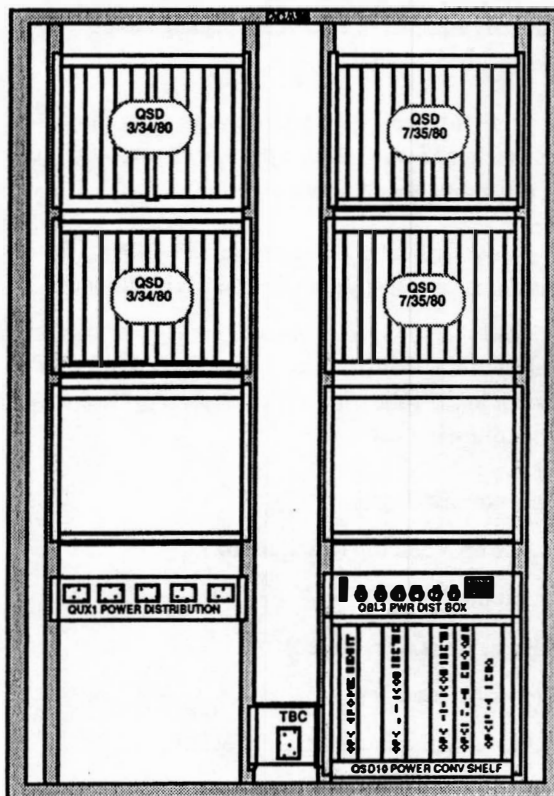
Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 3-2 shows a typical QCA28 cabinet and Figure 3-3 shows a QCA28 cabinet that has been upgraded to Meridian 1 Option 21E.

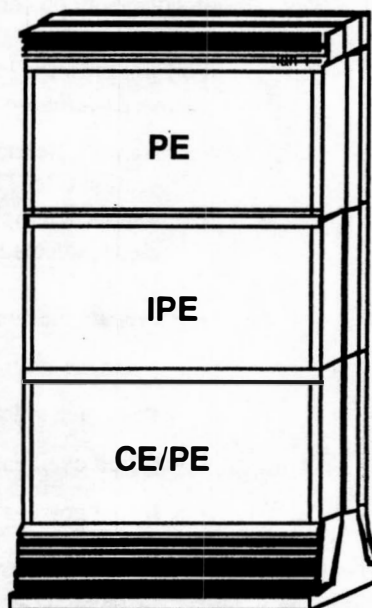
Figure 3-3

Typical QCA28 cabinet that has been upgraded to Meridian 1 Option 21E

QCA28 Cabinet



Option 21E Modules



Installing the Meridian 1 Option 21E system

The Option 21E equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, CPU/Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 21E equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 3-3 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.
- Install cabling:
 - Cable common equipment

- Cable network loops (within the Option 21E columns only).

Note: Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.

- Cable PE/IPE modules to the MDF and connect lines and trunks.

- Inspect Option 21E equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 3-4 shows Option 21E circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 3-3**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 3-3 (continued)
NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 3-3 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves				Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."					
For each slave, indicates the slave address				Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."					
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master		on						
	slave		off						
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

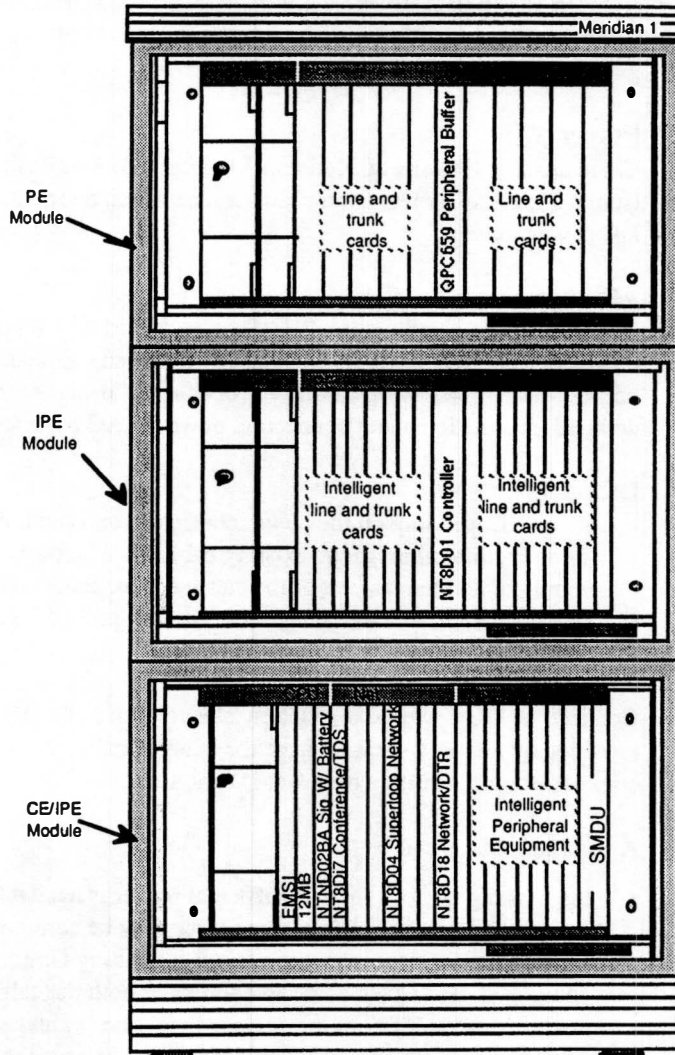
Table 3-3 (continued)

NT8D22 system monitor — settings for total number of slaves — SW2 on master

How many slave units		Switch position						How many slave units		Switch position					
		3	4	5	6	7	8			3	4	5	6	7	8
0		on	on	on	on	on	on	32		off	on	on	on	on	on
1		on	on	on	on	on	off	33		off	on	on	on	on	off
2		on	on	on	on	off	on	34		off	on	on	on	off	on
3		on	on	on	on	off	off	35		off	on	on	on	off	off
4		on	on	on	off	on	on	36		off	on	on	off	on	on
5		on	on	on	off	on	off	37		off	on	on	off	on	off
6		on	on	on	off	off	on	38		off	on	on	off	off	on
7		on	on	on	off	off	off	39		off	on	on	off	off	off
8		on	on	off	on	on	on	40		off	on	off	on	on	on
9		on	on	off	on	on	off	41		off	on	off	on	on	off
10		on	on	off	on	off	on	42		off	on	off	on	off	on
11		on	on	off	on	off	off	43		off	on	off	on	off	off
12		on	on	off	off	on	on	44		off	on	off	off	on	on
13		on	on	off	off	on	off	45		off	on	off	off	on	off
14		on	on	off	off	off	on	46		off	on	off	off	off	on
15		on	on	off	off	off	off	47		off	on	off	off	off	off
16		on	off	on	on	on	on	48		off	off	on	on	on	on
17		on	off	on	on	on	off	49		off	off	on	on	on	off
18		on	off	on	on	off	on	50		off	off	on	on	off	on
19		on	off	on	on	off	off	51		off	off	on	on	off	off
20		on	off	on	off	on	on	52		off	off	on	off	on	on
21		on	off	on	off	on	off	53		off	off	on	off	on	off
22		on	off	on	off	off	on	54		off	off	on	off	off	on
23		on	off	on	off	off	off	55		off	off	on	off	off	off
24		on	off	off	on	on	on	56		off	off	off	on	on	on
25		on	off	off	on	on	off	57		off	off	off	on	on	off
26		on	off	off	on	off	on	58		off	off	off	on	off	on
27		on	off	off	on	off	off	59		off	off	off	on	off	off
28		on	off	off	off	on	on	60		off	off	off	off	on	on
29		on	off	off	off	on	off	61		off	off	off	off	on	off
30		on	off	off	off	off	on	62		off	off	off	off	off	on
31		on	off	off	off	off	off	63		off	off	off	off	off	off
— continued —															

Table 3-3 (continued)
NT8D22 system monitor — slave address — SW2 on slave

Slave unit address							Position						
	3	4	5	6	7	8		3	4	5	6	7	8
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
32	off	on	on	on	on	on							

Figure 3-4**Meridian 1 Option 21E CPU/IPE module with IPE and PE modules**

Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 21E: one designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 21E, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Note: Depending on the power configuration used it may be required to do modifications to the existing cabinets. If modifications are required, do them as part of the cut-over procedures (described later in this document) to avoid unnecessary interruption of service to the end users.

Connect the DC power to the Option 21E columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 21E equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 21E module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 21E modules.

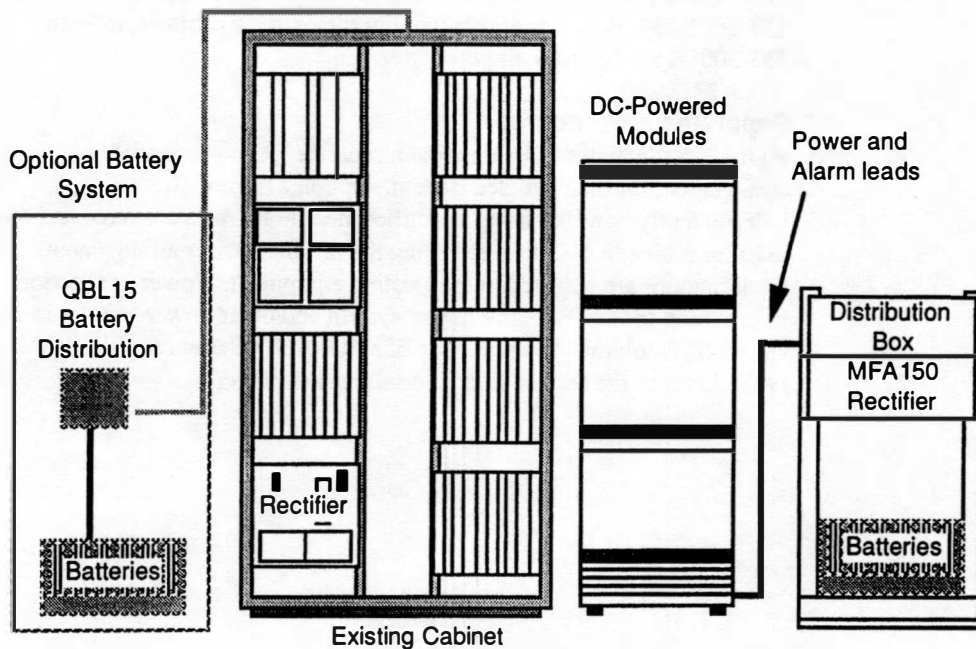
- a new power source installed in conjunction with the Option 21E.

To determine the power requirements for the Option 21E system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 3-5 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 21E modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option-21E column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 3-5
Typical arrangement of independently DC-powered Meridian 1 Option 21E modules



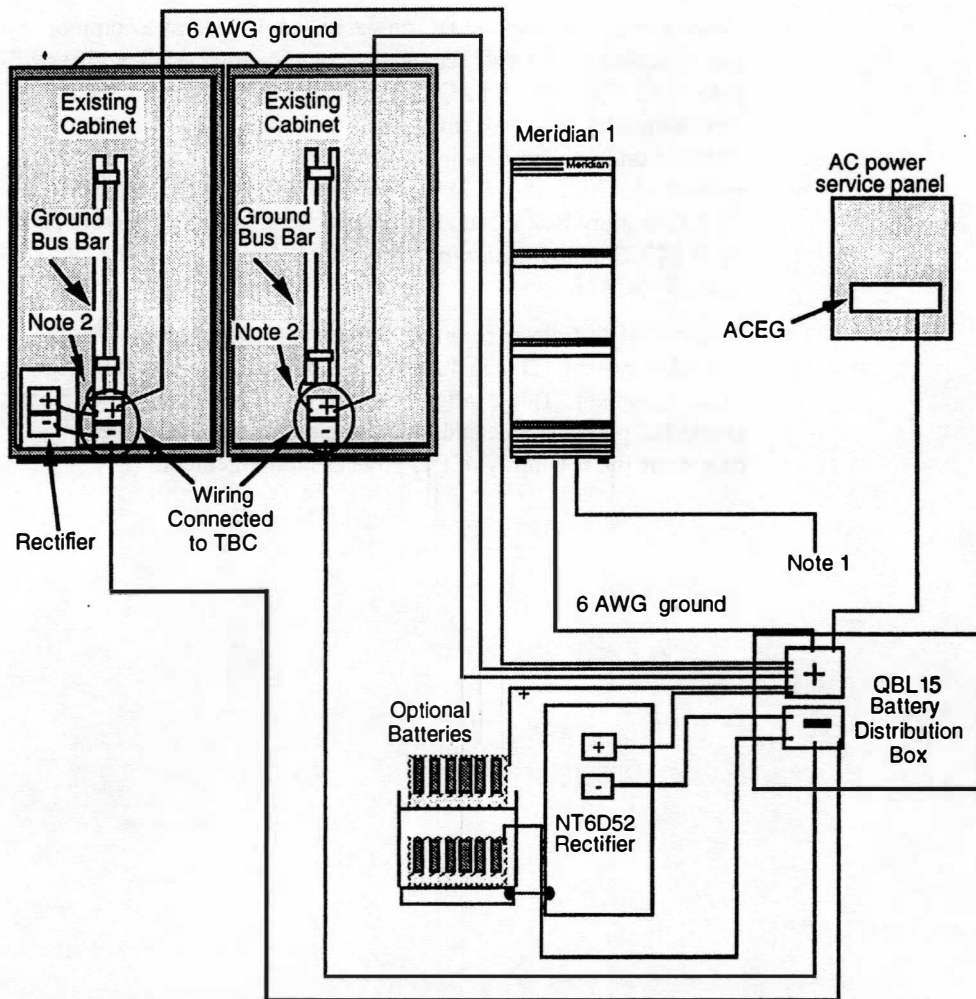
Note: An MFA150 cannot share a battery string connected to QBL15, QBL12 or QCA13. A separate battery string is required for the MFA150.

Common power source

Existing cabinet rectifier as a common power source

- When the existing cabinet DC power source is used as a common power source for the cabinet and the column, any QSD4 rectifier will have to be replaced with a QRF8 rectifier and the existing battery distribution box will have to be replaced with a QBL15 battery distribution box. For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 3-6 illustrates a common power supply arrangement for the upgraded system. This includes both Option 21E modules and the existing cabinet. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

Figure 3-6
Typical arrangement using a common DC power supply with optional battery backup



Note 1: DC power feeds from the QBL15 to the Meridian 1. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

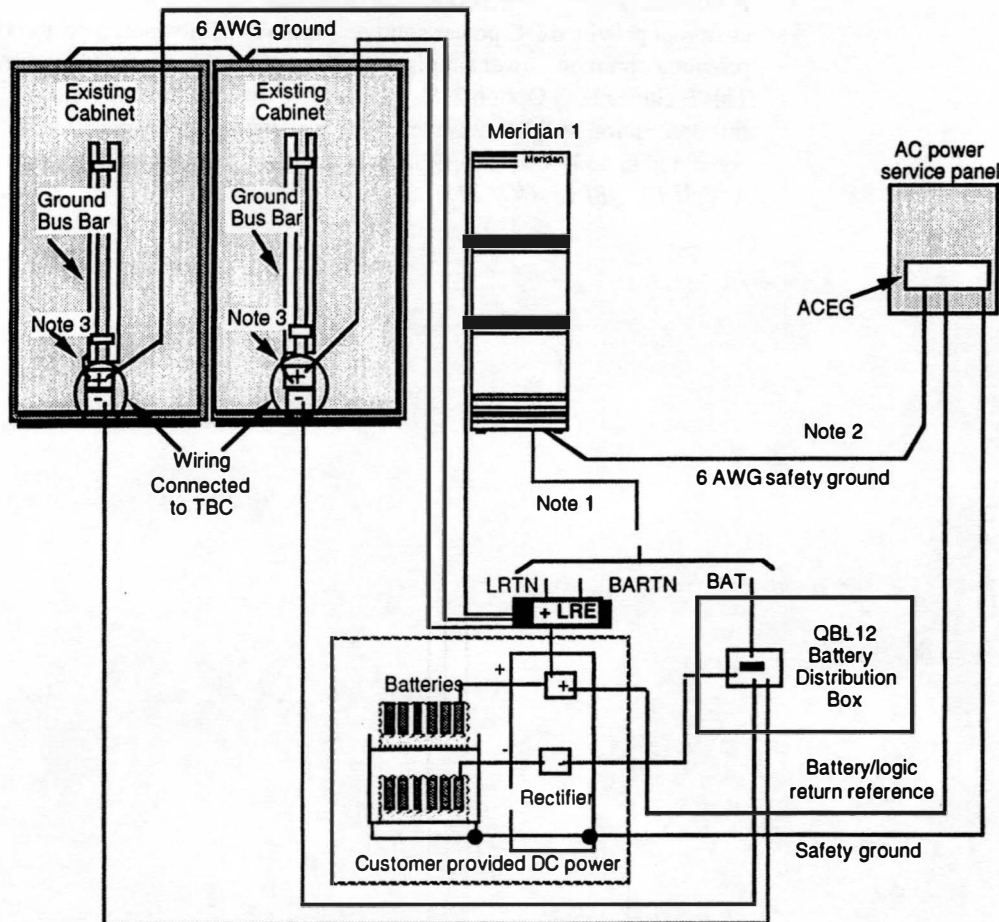
Note 2: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

Customer provided power as a common power source

- A QBL12 Battery Distribution Box is normally used to connect to a customer provided DC power source. Figure 3-7 illustrates a customer provided common power supply arrangement for the upgraded system. This includes both Option 21E modules and the existing cabinet. A full description of QBL12 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 3-7
Typical arrangement using a customer provided common DC power supply



Note 1: DC power feeds. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

Note 2: With customer provided power equipment, the Meridian 1 frame requires a direct connection to the ACEG. In addition, the positive bus bar in the customer provided equipment must connect to the ACEG.

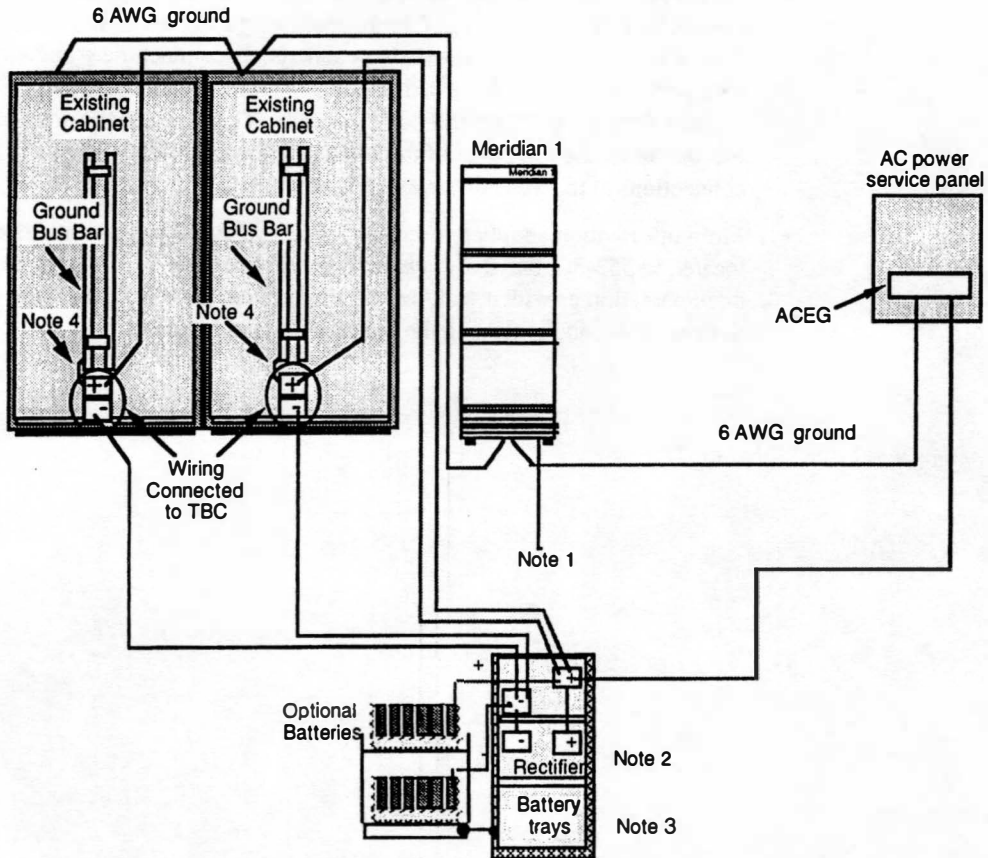
Note 3: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

An MFA150 power system as a common power source

- An MFA150 power system assembly can be used as a common power source for both the Option 21E and the existing cabinets as shown in Figure 3-8. To connect the existing cabinets, disconnect the + and - 48V power leads from the existing power source, then reroute and connect them to the MFA150 power system. The connections are located under the top cover of the MFA150 power system. The connections at the TBC of the existing cabinet do not change.
- More information about connections for the MFA150 power system is located in 553-3001-210, *System installation procedures*. Refer to the documentation provided with the existing system for information about disconnecting and removing the old rectifier and batteries.

Figure 3-8
Typical arrangement using an MFA150 power system as a common power source



Note 1: DC power feeds from the MFA150 to the Meridian 1. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

Note 2: The MFA150 power system may be equipped with one or two power shelves for a maximum of 75 amps or 150 amps respectively.

Note 3: Batteries may be installed in two optional battery trays located under the rectifier shelves.

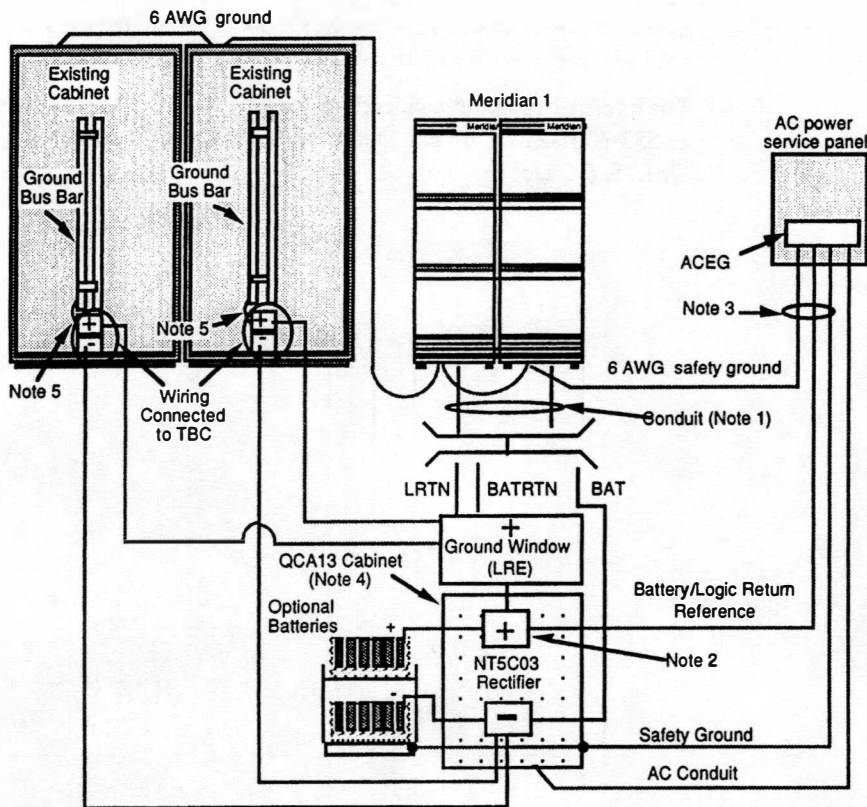
Note 4: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

An existing QCA13 power cabinet as a common power source

- A QCA13 power cabinet equipped with rectifiers can be used as a common power source for both the Option 21E and the existing cabinets as shown in Figure 3-9.
- For information about connections for the QCA13 power cabinet, refer to 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 3-9
Typical arrangement using a QCA13 as a common power source



Note 1: DC power feeds to Meridian 1 pedestals. Each feed consists of two BAT (-), two BATRTN (+), and one LRTN (+) conductors. If required, conductors can be run in conduit as shown. BAT (-) connects to the appropriate fuse in the rectifier cabinet.

Note 2: The QCA13 cabinet does not contain a bus for terminating individual battery and logic returns. A ground window should be used to consolidate all battery and logic returns.

Note 3: The Battery/Logic Return Reference wiring and the safety ground wiring must be #6 AWG, minimum.

Note 4: Up to four NT5C03 rectifiers can be equipped in a QCA13 cabinet for a total of 200 amps.

Note 5: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 21E modules.

These cables connect the System Monitor to the SDI Paddle Board in the CPU/Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section 'Separate power source' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 3-10) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12 or QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 21E system:

- 1 Power up and initially load the Option 21E column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *On-site software conversion* was performed.
- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
- 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *On-site software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
- 4 The Meridian 1 Option 21E system is now operational.

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 21E column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 Connect an NT8D86 cable between the connector on the faceplate of the network card and the I/O panel of the Option 21E. One cable is required for each network loop.
- 2 Connect an NT8D73 shielded cable, up to 30 ft (9 m) in length, to the connector on the I/O panel of the Option 21E. Route the NT8D73 cable to the existing cabinet. Do not connect it to the Peripheral Buffer card in the existing cabinet at this time.

Note: Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

- 3 If required in the existing cabinet (see Note) connect an NT8D86 cable to the connector on the NT8D73 shielded cable from the Option 21E. Make sure that the connectors are locked together with the locking devices. Do not connect the cable to the faceplate of the Peripheral Buffer card at this time. It will be connected as part of the cutover procedure.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable.

Cutting-over

The following procedure describes how to cut-over to the Option 21E system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL12 or QCA13 unit**
Remove the fuses from the -48V fuse panel corresponding to each cabinet and column.
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.

Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.

- **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
 - **AC powered modules**
Set the AC power supply breaker at the AC power service panel to OFF.
- 2 If required, perform power modifications to the existing cabinets.
 - 3 In the existing cabinets, remove the wiring connecting the frame of the cabinet to the positive (+) connection of the TBC, and the wiring connecting the frame to the cabinet ground bus bar. Refer to Figures 3-5 through 3-7.

Note: This wiring was factory installed. It must be removed to avoid ground loops when existing cabinets are used with Meridian 1 modules.

- 4 This step applies only to Meridian 1 modules connected to a DC power source.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 3-10) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

- 5 This step applies only if a new common power source with battery backup connected to a QBL12, QBL15 or QCA13 battery distribution box is to be used.

Note: This step does not apply if the common power source uses an MFA150 rectifier.

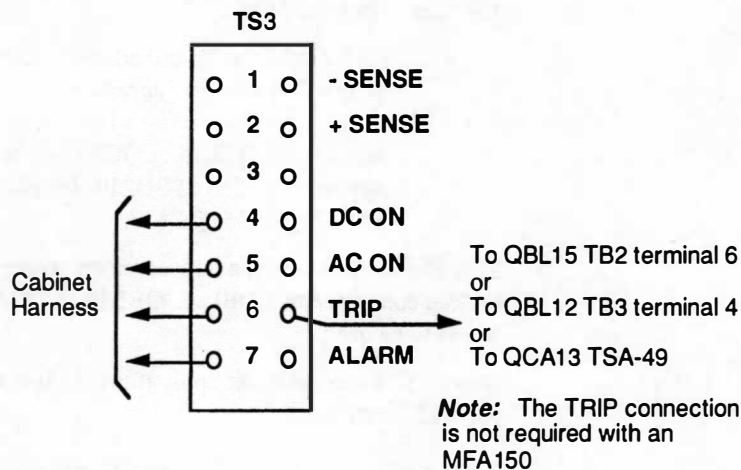
A TRIP lead must be connected to the TRIP connection on:

- the TRIP terminal on the terminal strip on the rectifier in existing cabinets equipped with a rectifier.
- the TRIP terminal of TS3 in existing cabinets not equipped with a rectifier.

The TRIP leads must be connected as follows.

If the existing rectifier is being removed from the cabinet, make the following wiring changes.

- a) If not already connected to TS3, tag and move the cabinet harness DC ON, AC ON, TRIP and ALARM leads presently connected on the rectifier to TS3 as shown in the above drawing. Depending on the type of existing cabinet, the TS3 is located either on the cabinet's TBC block, or on the QUT3 power unit.



- b) Install and connect a 16 AWG wire from terminal 6 (TRIP) on TS3 to the TRIP connection in the QBL12, QBL15 or QCA13 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connections in each cabinet with 16 AWG wire.
- c) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.

Note: The DC ON, AC ON and ALARM lead functions are performed by the Meridian 1 module. Leaving these leads connected in the existing cabinets only extends the alarm indicators to the QPC84 power monitors. If you wish, you may leave these leads disconnected. However, the TRIP lead must be connected.

If the existing rectifier is to remain in the cabinet, make the following wiring changes.

- a) Install and connect a 16 AWG wire from the TRIP connection on the terminal strip of the rectifier to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connection on the terminal strip of the rectifier in each cabinet with 16 AWG wire. In existing cabinets not equipped with a rectifier (such as a QCA7 cabinet powered by a QCA8 cabinet), 'daisy chain' to the TRIP connection on TS3.
 - b) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.
- 6 Cross-connect the alarm cables as shown in Figure 3-11.
 - 7 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.
 - 8 Connect the NT8D86 cables (if provided) or NT8D73 shielded network cables from the Option 21E to the connector on the faceplate of the Peripheral Buffer circuit card in the existing cabinets.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable. The NT8D73 shielded cable can be connected directly to the connector of the Peripheral Buffer card.

—OR—

If the existing cabinet is equipped to suppress EMI, the NT8D73 shielded cable should be connected to its assigned filter connector. See 553-3001-150, *Upgrade Engineering* for more information.

- 9 Remove the QPC84 Power Monitor from the QCA28 cabinet and set switch C11, positions 1 and 2 to ON to disable monitoring the power in the CE shelf. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required. Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.

Note: Disregard any remaining alarm indications. Alarm indications should return to normal once the upgrade is completed and equipment that is no longer required has been removed as described later in this chapter.

- 10 Restore power to the cabinets and column by reinserting the removed fuse and resetting all circuit breakers to ON.

CAUTION

Do not remove the NT8D22 system monitor (XSM) from the column while the system is in service. Removing the XSM may cause the input circuit breakers on the existing cabinets to trip.

- 11 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Figure 3-10
NT8D46 cable types

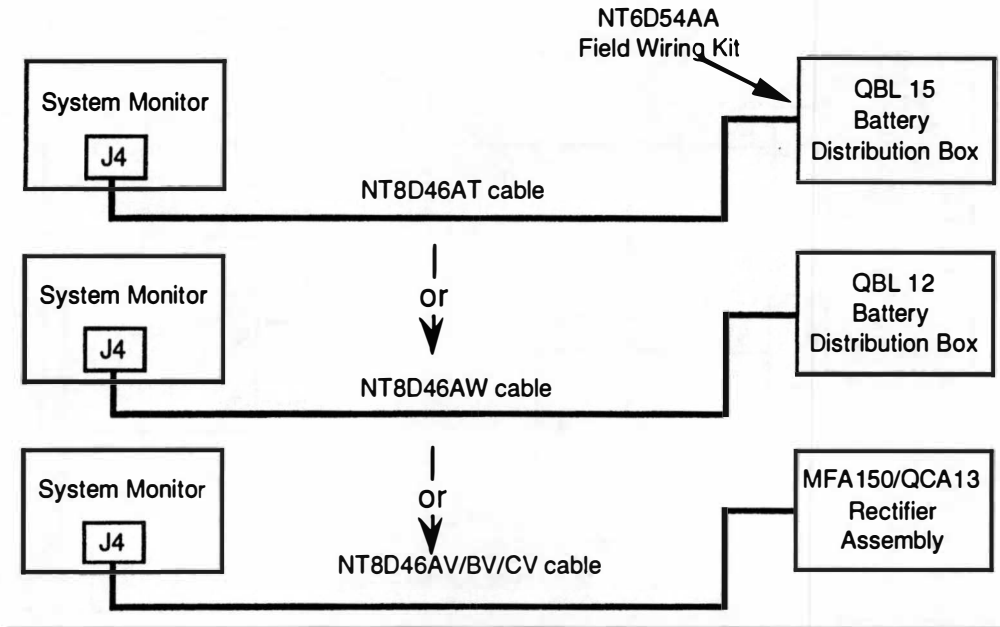
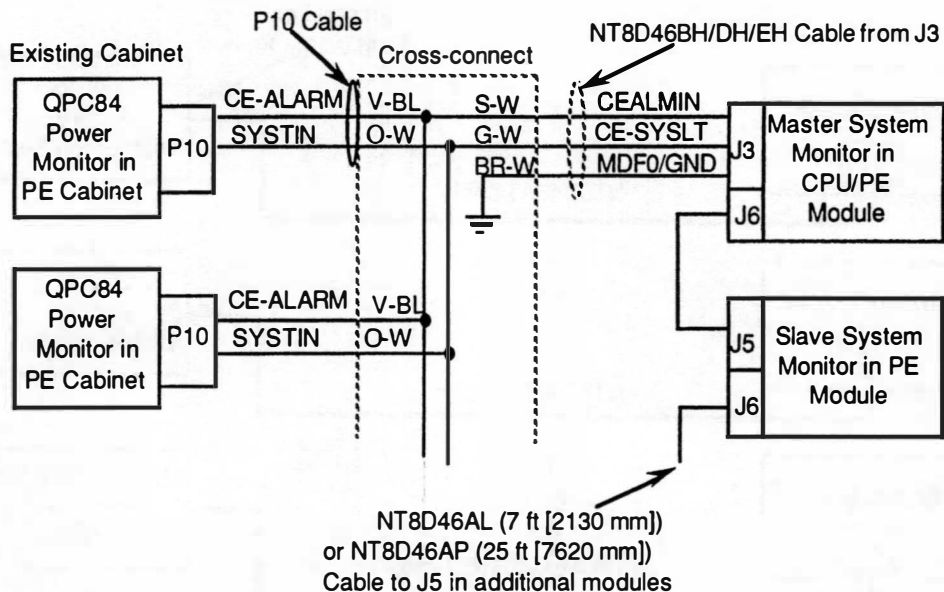


Figure 3-11
Connecting alarm cables between a cabinet and a column



Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

Removing equipment no longer required

The following procedure describes how to remove the equipment that is no longer required once the Option 21E is operating normally.

- 1 Set circuit breakers for the CE shelves on the QBL3 power distribution panel in the QCA28 cabinet to OFF.
- 2 Disconnect the cables from the front of all circuit cards on the QSD18 CE shelf, the QSD19 CE shelf, if equipped, and the QSD2 CE shelf, if equipped.
- 3 Remove CE circuit cards from the QSD18, QSD19, or QSD2 CE shelves and store them in a safe place.
- 4 Remove the tape unit from the cabinet.

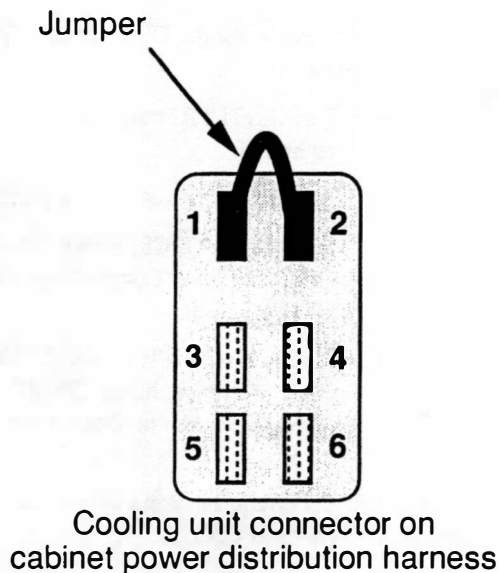
Note: The tape unit must first be removed before the tape unit connector can be disconnected.

- 5 If you are using the CE shelf for DTI/PRI cards without clock reference:
 - Install DTI/PRI cards into shelves QSD18 and QSD19, if equipped.
 - Install DTI/PRI cards into shelf QSD2, if equipped.
 - Replace the QPC85 Power Converter with a QPC190 or a QPC355 Power Converter to support maximum number of DTI/PRI cards.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the CPU/Network module of the Option 21E upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breakers for the CE shelves on the power distribution panel to ON.
- 6 If you are not going to use the CE shelf for DTI/PRI cards:
 - Disconnect power connectors and alarm connectors from the QSD18 shelf, the QSD19, or the QSD2 shelf, if equipped. Tape all exposed power leads with electrical insulation tape.

Note: If the cabinet is equipped with an expansion CE shelf (a second CE shelf) disconnect and remove the wiring between the +5V, +12V, -12V, and LGND connections on the CE shelf.

- Disconnect all CE alarm connectors.
- Tape all exposed power leads with electrical insulation tape.
- Disconnect and remove the QUD4, QUD6 or QUD8 (or both, if equipped) from the cabinet. Place a jumper (a piece of 24 or 26 AWG bare wire or a paper clip can be used) across power monitor leads 1 and 2 of the cooling unit power connector as shown in Figure 3-12. This disables the alarm for the removed unit.

Figure 3-12
Cooling unit alarm connection



SL-1 QCA37 cabinet upgrade to Meridian 1 Option 21E

This procedure is used to upgrade an SL-1 QCA37 cabinet (M, MS, ST or 21) to Meridian 1 Option 21E. To upgrade to a Meridian 1 Option 21E system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 21E:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 21E operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 21E is operating with the new software provided with the Option 21E.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 21E operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Hardware upgrade methods

There are two methods of upgrading a QCA37 cabinet to a Meridian 1 Option 21E:

- 1 If the CPU shelf has been previously upgraded to a QSD81 (ST or 21) then either the card level or modular upgrade may be performed.
- 2 If the CPU shelf has not been previously upgraded to a QSD81 then a modular upgrade must be done.

Card upgrade of an SL-1 QCA37 cabinet (ST or 21) to Meridian 1 Option 21E

Equipment required

Table 4-1 lists minimum hardware requirements needed for a card level upgrade of a QCA37 cabinet to a Meridian 1 Option 21E.

Table 4-1

Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT9D33AA	Small System Multi-Drive Unit (SMDU)
1	1	NT9D34AA	Enhanced Multi-Drive System Interface (EMSI)
	1	NT9D47AB	EMSI to SMDU Data Cable, 2 ft (610mm)
1		or	
	1	NT9D47AD	EMSI to SMDU Data Cable, 6 ft (1830mm)
1	1	NT9D66AB	EMSI to SMDU Power Cable, 2 ft (610mm)
		or	
1	1	NT9D66AD	EMSI to SMDU Power Cable, 6 ft (1830mm)
1	1	NTND01CA	12MB CPU/Memory Card
1	1	NTND02BA Rls 2	Misc, Dual SDI Peripheral Signaling Pack with Battery (MSPS)
1	1	NTND31AA Rls 3	Daughter board (ROM)

Note: The vintages shown on circuit cards in Table 4-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

Summary of steps to upgrade

Upgrading consists of:

- removal of CPU/MEM, PS, FDI and FDU
- installation of Option 21E cards and cables
- sysload

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

Removal of CPU/MEM, PS, FDI and FDU

To remove cards:

- 1 Remove software disks from the Floppy Disk Unit.
- 2 Disconnect the cable from the faceplate of the FDI and FDU.
- 3 Set the ENB/DIS switches on cards located in slots 1, 2, 3 and 4 to DIS.
- 4 Remove the Floppy Disk Unit and cards located in slots 1, 2, 3 and 4.

Installing equipment

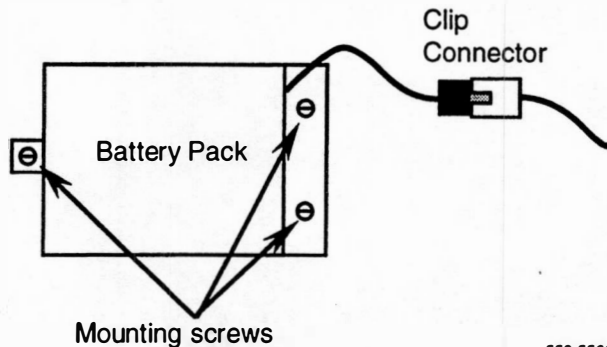
To install cards and cables:

- 1 Set the ENB/DIS switch on the NT9D34 EMSI card to DIS.
- 2 Mount the appropriate software cartridge on the EMSI card and set option switches 1, 5, 7 and 8 to ON.
- 3 Install EMSI card in card slot 3 and set the ENB/DIS switch to ENB.
- 4 Install the NTND31AA ROM card onto the NTND01CA CPU/Memory card:
 - Carefully plug the ROM card into the pin connector.
 - Install the screw and washer at each corner of the ROM card.
- 5 Install the CPU/Memory card in card slot 2.
- 6 Set the ENB/DIS switch on the MSPS card to DIS.
- 7 Set option switches on the MSPS card to activate SDI ports. To avoid conflicting addresses, determine the appropriate option switch settings, refer to *Circuit card installation and testing* (553-3001-211).

- 8 Connect the battery pack on the NTND02BA MSPS card by plugging the battery clip connector to the clip connector on the board as illustrated in Figure 4-1.

Note: The battery will not be fully charged until 24 hours after installation in a powered system.

Figure 4-1
Battery pack connection to the MSPS



553-5566

- 9 Install the NTND02BA MSPS card in slot 4.
- 10 Connect the NTND37 Dual SDI cable to the connector on the NTND02BA MSPS faceplate.
- 11 Set the ENB/DIS switch on the NTND02BA MSPS card to ENB.
- 12 Install the NT9D33 SMDU in its assigned position in the CE shelf. The SMDU may be installed in an alternate location such as the old network shelf in position 6 or any available PE slots, provided the NT9D47 and NT9D66 interface cables will reach from the SMDU to the EMSI.

Sysload

Before you sysload the system, review installation steps and verify that all circuit cards are in the appropriate card slots, ENB/DIS switches are set to ENB, and all cables are properly connected.

- 1 To sysload the system insert the floppy disks into disk drives and press Rld on the CPU/MEM card.**
- 2 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.**

Modular upgrade of an SL-1 QCA37 cabinet (M, MS, ST or 21) to Meridian 1 Option 21E

Equipment required

Table 4-2 lists minimum hardware requirements needed to upgrade a QCA37 cabinet to a Meridian 1 Option 21E.

Table 4-2

Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT6D43AA or NT7D04AA Rls 3	CE/PE power supply DC
		NT7D00AA	Top cap AC
1	1	NT7D00BA Rls 2	Top cap DC
	1	NT7D09CA	Pedestal DC
1		NT7D14AA or NT8D29AA Rls 4	CE/PE power supply AC
1		NT8D11AB Rls 2	CE/PE module AC
	1	NT8D11DC	CE/PE module DC
1		NT8D27AB Rls 3	Pedestal AC
1	1	NT8D22AC	System monitor
1		NT8D52AA	Pedestal blower unit AC
	1	NT8D52DC	Pedestal blower unit DC (DC system)
1		NT8D53AB Rls 5	Power distribution AC
-continued-			

Table 4-2 (continued)

Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT8D17AA RIs 9	Conference/TDS circuit card
1	1	NT8D18AA RIs 9	Digitone Receiver Network card
1	1	NT8D41AA RIs 2	2 Port SDI Paddle Board
1	1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	1	NT8D46AL	System monitor serial link cable
1	1	NT8D46BH	System monitor to SDI cable
1	1	NT8D82	MSPS to I/O cable
3	3	NT8D84AA	SDI Paddle Board to I/O Cable
1	1	NT8D95AJ	SDI I/O panel to DTE/DCE, 16 ft (4875 mm)
1	1	NT9D33AA	Small System Multi-Drive Unit (SMDU)
1	1	NT9D34AA	Enhanced Multi-Drive System Interface (EMSI)
1	1	NT9D47AB	EMSI to SMDU Data Cable, 2 ft (610mm)
	1	or NT9D47AD	EMSI to SMDU Data Cable, 6 ft (1830mm)
1	1	NT9D66AB	EMSI to SMDU Power Cable, 2 ft (610mm)
	1	or NT9D66AD	EMSI to SMDU Power Cable, 6 ft (1830mm)
1	1	NTND01CA	12MB CPU/Memory Card
1	1	NTND02BA RIs 2	Misc, Dual SDI Peripheral Signaling Pack with Battery (MSPS)
1	1	NTND31AA RIs 3	ROM daughter board
1	1	NTND37AA	MSPS I/O to DTE/DCE cable 8 ft (2440 mm)
1	1	QPC84Q	Power Monitor

Note: The vintages shown on circuit cards in Table 4-2 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA 37 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 21E Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 21E to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 21E to the existing cabinet.
- A second NT8D86 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Note: The second NT8D86 cable is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as a QCA7 or 8) do not require the second NT8D86 cable since the NT8D73 cable can be connected directly to the Peripheral Buffer connector. For existing cabinets equipped to suppress EMI, refer to 553-3001-150, *Upgrade Engineering*.

Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

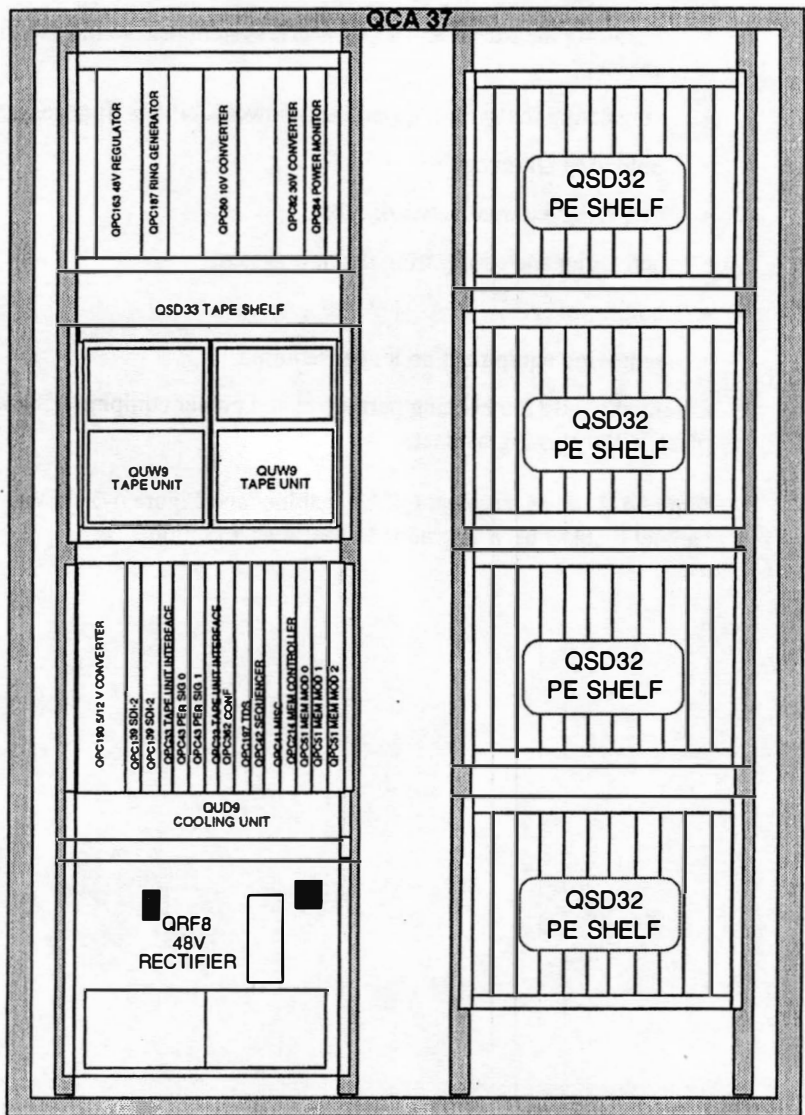
Upgrading consists of:

- installing the Meridian 1 Option 21E system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 4-2 shows a typical QCA37 cabinet and Figure 4-3 shows a QCA37 cabinet that has been upgraded to Meridian 1 Option 21E.

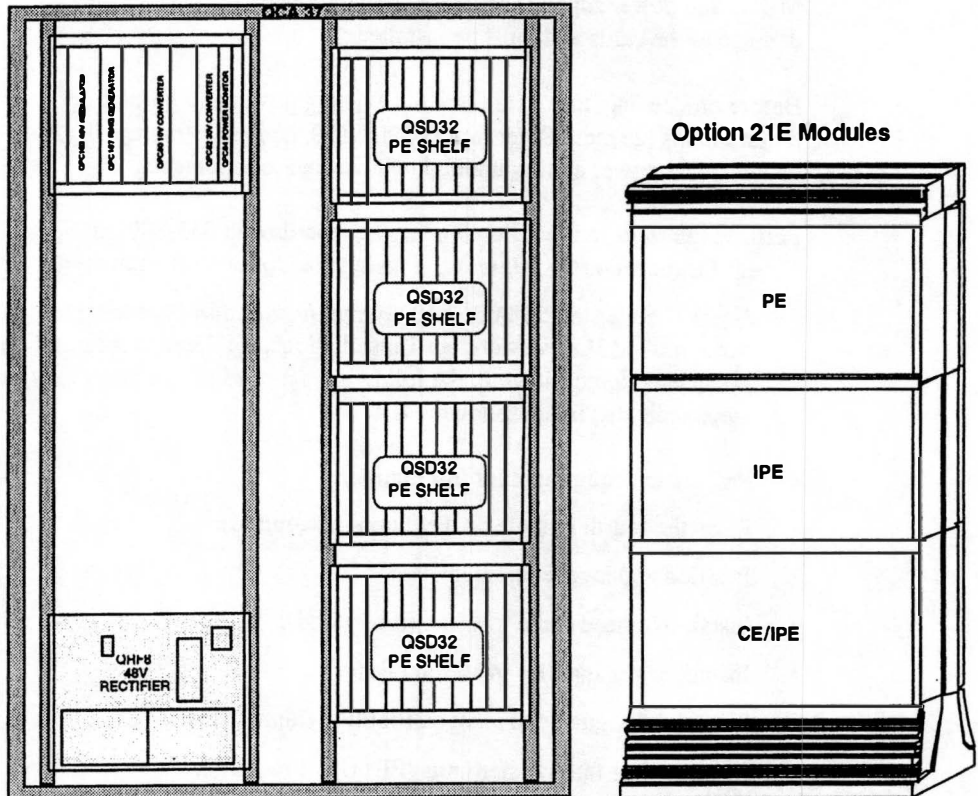
Figure 4-2
Typical QCA37 cabinet



553-5712

Figure 4-3
Typical QCA37 cabinet that has been upgraded to Meridian 1 Option 21E

SL-1 M System Cabinet



Installing the Meridian 1 Option 21E system

The Option 21E equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, CPU/Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 21E equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 4-3 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.

- Install cabling:
 - Cable common equipment
 - Cable network loops (within the Option 21E columns only).
- Note:** Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.
- Cable PE/TPE modules to the MDF and connect lines and trunks.
- Inspect Option 21E equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 4-4 shows Option 21E circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 4-3

NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 4-3 (continued)**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 4-3 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 Indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves				Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."					
For each slave, indicates the slave address				Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."					
SW3 Indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master		on						
	slave		off						
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

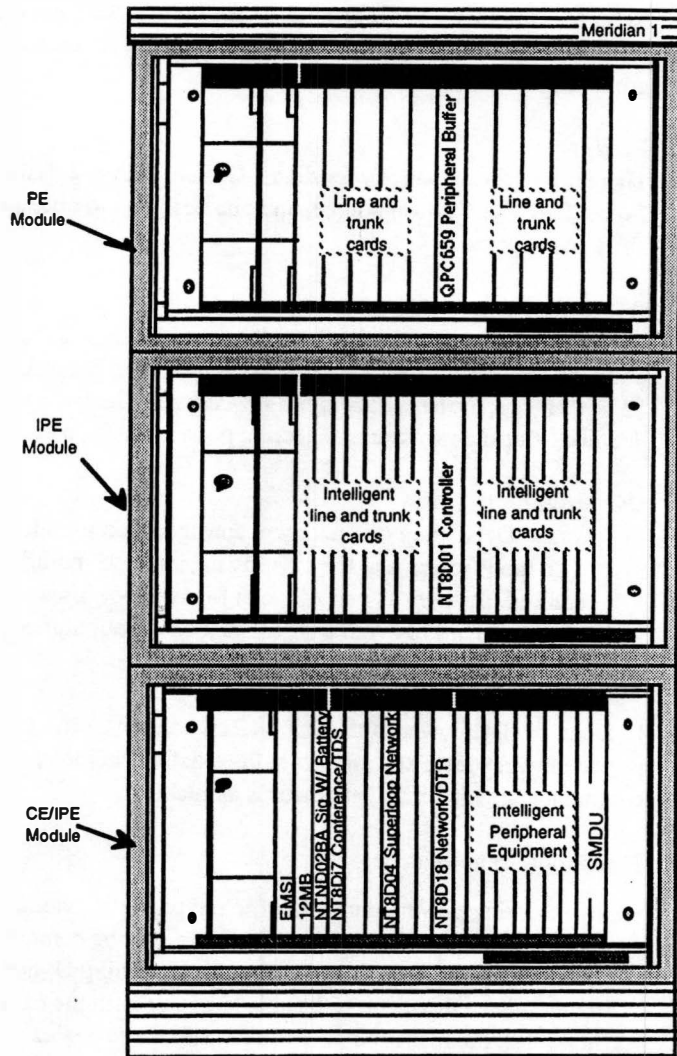
Table 4-3 (continued)

NT8D22 system monitor — settings for total number of slaves — SW2 on master

How many slave units		Switch position						How many slave units		Switch position					
		3	4	5	6	7	8			3	4	5	6	7	8
0		on	on	on	on	on	on	32		off	on	on	on	on	on
1		on	on	on	on	on	off	33		off	on	on	on	on	off
2		on	on	on	on	off	on	34		off	on	on	on	off	on
3		on	on	on	on	off	off	35		off	on	on	on	off	off
4		on	on	on	off	on	on	36		off	on	on	off	on	on
5		on	on	on	off	on	off	37		off	on	on	off	on	off
6		on	on	on	off	off	on	38		off	on	on	off	off	on
7		on	on	on	off	off	off	39		off	on	on	off	off	off
8		on	on	off	on	on	on	40		off	on	off	on	on	on
9		on	on	off	on	on	off	41		off	on	off	on	on	off
10		on	on	off	on	off	on	42		off	on	off	on	off	on
11		on	on	off	on	off	off	43		off	on	off	on	off	off
12		on	on	off	off	on	on	44		off	on	off	off	on	on
13		on	on	off	off	on	off	45		off	on	off	off	on	off
14		on	on	off	off	off	on	46		off	on	off	off	off	on
15		on	on	off	off	off	off	47		off	on	off	off	off	off
16		on	off	on	on	on	on	48		off	off	on	on	on	on
17		on	off	on	on	on	off	49		off	off	on	on	on	off
18		on	off	on	on	off	on	50		off	off	on	on	off	on
19		on	off	on	on	off	off	51		off	off	on	on	off	off
20		on	off	on	off	on	on	52		off	off	on	off	on	on
21		on	off	on	off	on	off	53		off	off	on	off	on	off
22		on	off	on	off	off	on	54		off	off	on	off	off	on
23		on	off	on	off	off	off	55		off	off	on	off	off	off
24		on	off	off	on	on	on	56		off	off	off	on	on	on
25		on	off	off	on	on	off	57		off	off	off	on	on	off
26		on	off	off	on	off	on	58		off	off	off	on	off	on
27		on	off	off	on	off	off	59		off	off	off	on	off	off
28		on	off	off	off	on	on	60		off	off	off	off	on	on
29		on	off	off	off	on	off	61		off	off	off	off	on	off
30		on	off	off	off	off	on	62		off	off	off	off	off	on
31		on	off	off	off	off	off	63		off	off	off	off	off	off
— continued —															

Table 4-3 (continued)
NT8D22 system monitor — slave address — SW2 on slave

Slave unit address Position							Slave unit address Position						
	3	4	5	6	7	8		3	4	5	6	7	8
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
32	off	on	on	on	on	on							

Figure 4-4**Meridian 1 Option 21E CPU/IPE module with IPE and PE modules**

Connecting system ground and power Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 21E: one designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 21E, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Note: Depending on the power configuration used it may be required to do modifications to the existing cabinets. If modifications are required, do them as part of the cut-over procedures (described later in this document) to avoid unnecessary interruption of service to the end users.

Connect the DC power to the Option 21E columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 21E equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 21E module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 21E modules.

- a new power source installed in conjunction with the Option 21E.

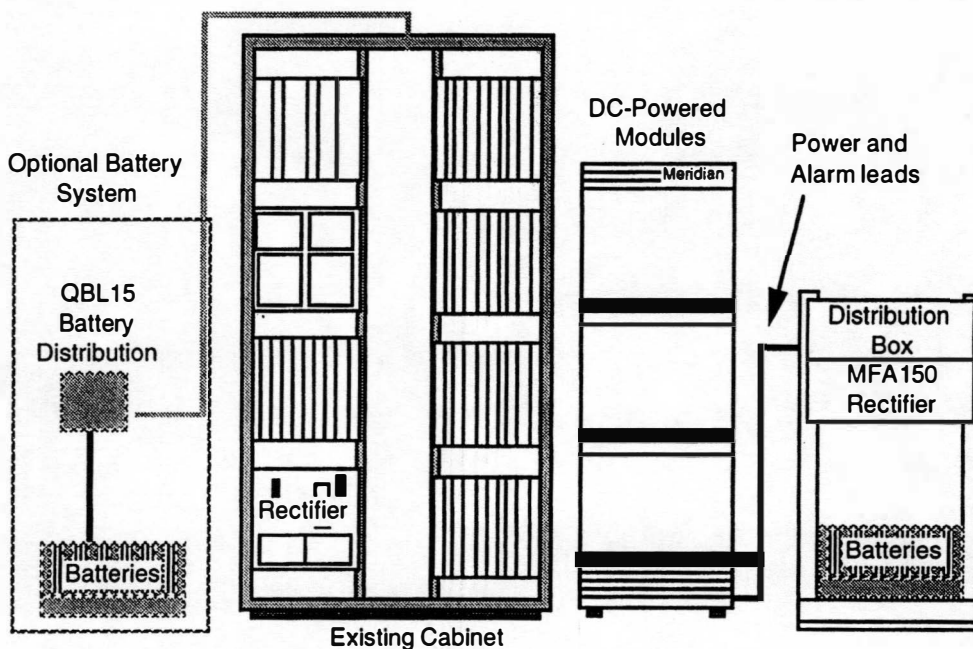
To determine the power requirements for the Option 21E system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 4-5 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 21E modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 21E column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 4-5

Typical arrangement of independently DC-powered Meridian 1 Option 21E modules



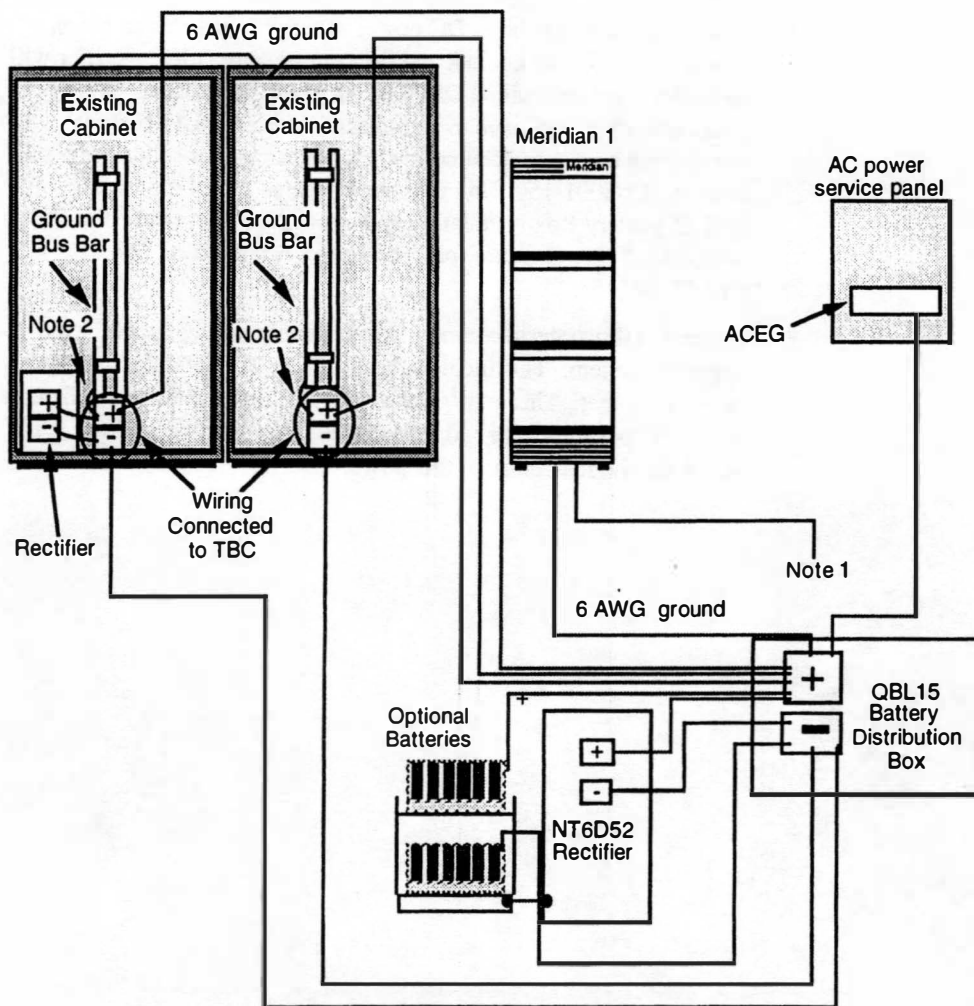
Note: An MFA150 cannot share a battery string connected to QBL15, QBL12 or QCA13. A separate battery string is required for the MFA150.

Common power source

Existing cabinet rectifier as a common power source

- When the existing cabinet DC power source is used as a common power source for the cabinet and the column, any QSD4 rectifier will have to be replaced with a QRF8 rectifier and the existing battery distribution box will have to be replaced with a QBL15 battery distribution box. For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 4-6 illustrates a common power supply arrangement for the upgraded system. This includes both Option 21E modules and the existing cabinet. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

Figure 4-6
Typical arrangement using a common DC power supply with optional battery backup



Note 1: DC power feeds from the QBL15 to the Meridian 1. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

Note 2: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

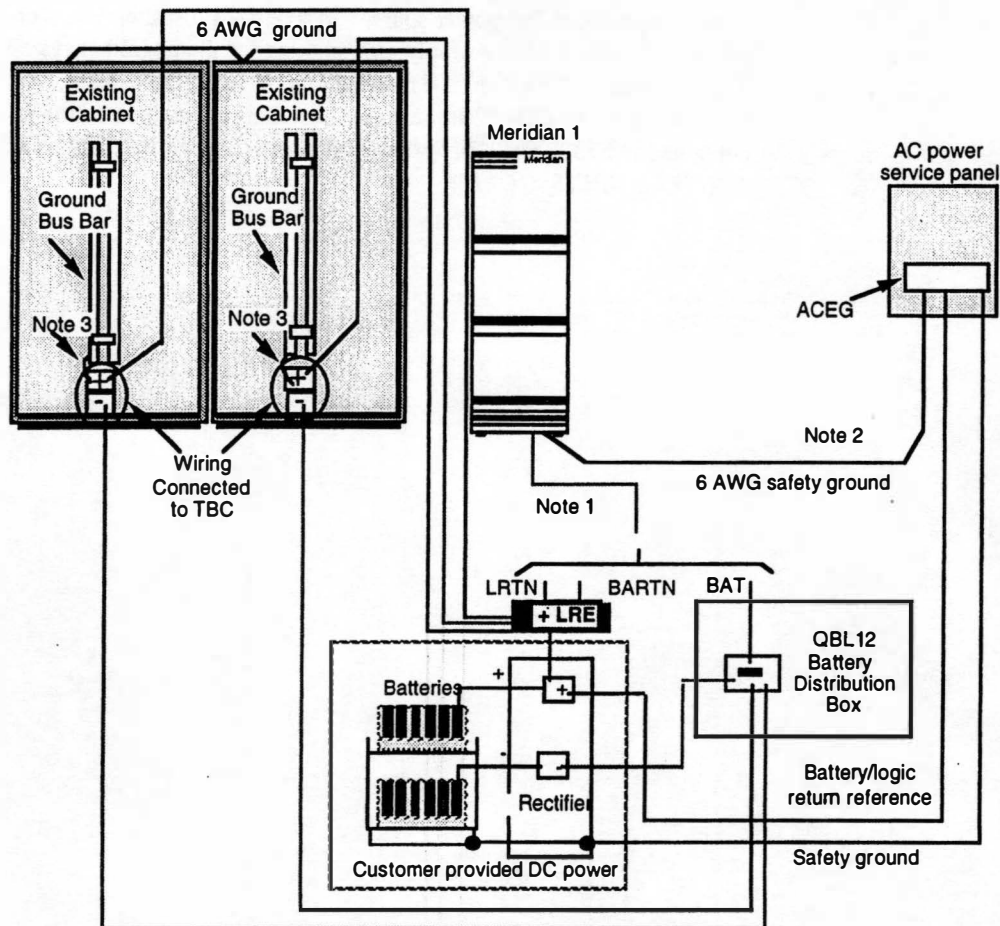
At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

Customer provided power as a common power source

- A QBL12 Battery Distribution Box is normally used to connect to a customer provided DC power source. Figure 4-7 illustrates a customer provided common power supply arrangement for the upgraded system. This includes both Option 21E modules and the existing cabinet. A full description of QBL12 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 4-7

Typical arrangement using a customer provided common DC power supply



Note 1: DC power feeds. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

Note 2: With customer provided power equipment, the Meridian 1 frame requires a direct connection to the ACEG. In addition, the positive bus bar in the customer provided equipment must connect to the ACEG.

Note 3: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

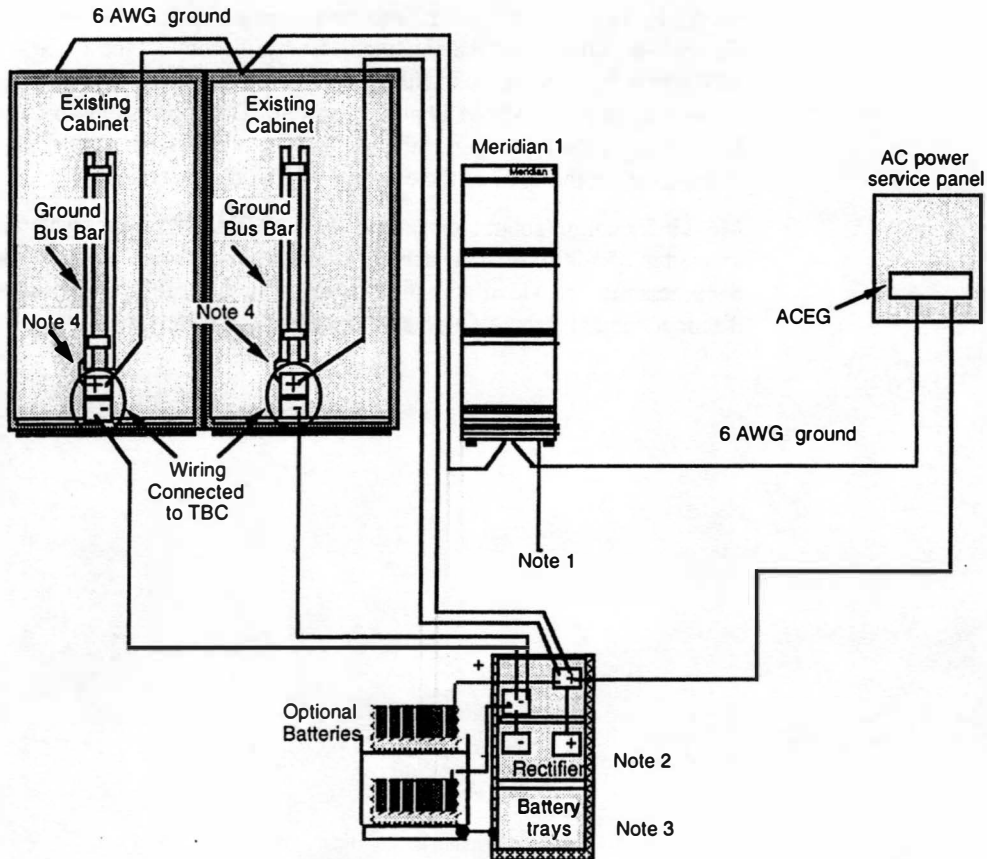
At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

An MFA150 power system as a common power source

- An MFA150 power system assembly can be used as a common power source for both the Option 21E and the existing cabinets as shown in Figure 4-8. To connect the existing cabinets, disconnect the + and - 48V power leads from the existing power source, then reroute and connect them to the MFA150 power system. The connections are located under the top cover of the MFA150 power system. The connections at the TBC of the existing cabinet do not change.
- More information about connections for the MFA150 power system is located in 553-3001-210, *System installation procedures*. Refer to the documentation provided with the existing system for information about disconnecting and removing the old rectifier and batteries.

Figure 4-8

Typical arrangement using an MFA150 power system as a common power source



Note 1: DC power feeds from the MFA150 to the Meridian 1. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

Note 2: The MFA150 power system may be equipped with one or two power shelves for a maximum of 75 amps or 150 amps respectively.

Note 3: Batteries may be installed in two optional battery trays located under the rectifier shelves.

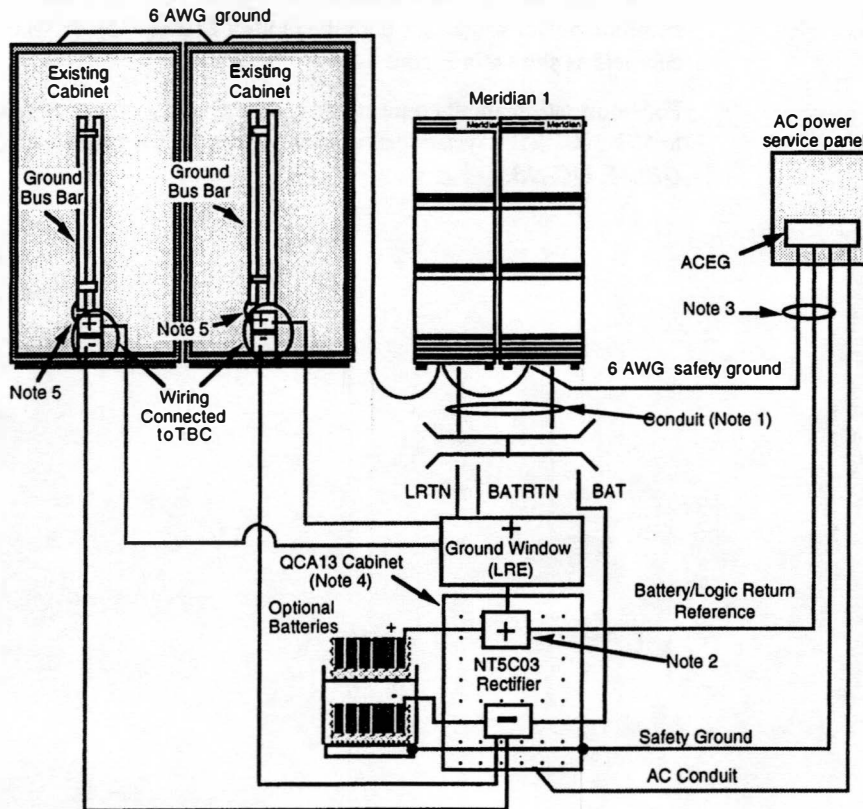
Note 4: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

An existing QCA13 power cabinet as a common power source

- A QCA13 power cabinet equipped with rectifiers can be used as a common power source for both the Option 21E and the existing cabinets as shown in Figure 4-9.
- For information about connections for the QCA13 power cabinet, refer to 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 4-9
Typical arrangement using a QCA13 as a common power source



Note 1: DC power feeds to Meridian 1 pedestals. Each feed consists of two BAT (-), two BATRTN (+), and one LRTN (+) conductors. If required, conductors can be run in conduit as shown. BAT (-) connects to the appropriate fuse in the rectifier cabinet.

Note 2: The QCA13 cabinet does not contain a bus for terminating individual battery and logic returns. A ground window should be used to consolidate all battery and logic returns.

Note 3: The Battery/Logic Return Reference wiring and the safety ground wiring must be #6 AWG, minimum.

Note 4: Up to four NT5C03 rectifiers can be equipped in a QCA13 cabinet for a total of 200 amps.

Note 5: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 21E modules.

These cables connect the System Monitor to the SDI Paddle Board in the CPU/Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BHDH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section 'Separate power source' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 4-10) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 21E system:

- 1 Power up and initially load the Option 21E column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.
- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *XII input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *XII input/output guide*.
- 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
- 4 The Meridian 1 Option 21E system is now operational.

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 21E column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 Connect an NT8D86 cable between the connector on the faceplate of the network card and the I/O panel of the Option 21E. One cable is required for each network loop.
- 2 Connect an NT8D73 shielded cable, up to 30 ft (9 m) in length, to the connector on the I/O panel of the Option 21E. Route the NT8D73 cable to the existing cabinet. Do not connect it to the Peripheral Buffer card in the existing cabinet at this time.

Note: Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

- 3 If required in the existing cabinet (see Note) connect an NT8D86 cable to the connector on the NT8D73 shielded cable from the Option 21E. Make sure that the connectors are locked together with the locking devices. Do not connect the cable to the faceplate of the Peripheral Buffer card at this time. It will be connected as part of the cutover procedure.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable.

Cutting-over

The following procedure describes how to cut-over to the Option 21E system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL12 or QCA13 unit**
Remove the fuses from the -48V fuse panel corresponding to each cabinet and column.
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.

Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.

- **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
 - **AC powered modules**
Set the AC power supply breaker at the AC power service panel to OFF.
- 2 If required, perform power modifications to the existing cabinets.
 - 3 In the existing cabinets, remove the wiring connecting the frame of the cabinet to the positive (+) connection of the TBC, and the wiring connecting the frame to the cabinet ground bus bar. Refer to Figures 4-6 through 4-8.

Note: This wiring was factory installed. It must be removed to avoid ground loops when existing cabinets are used with Meridian 1 modules.

- 4 This step applies only to Meridian 1 modules connected to a DC power source.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 4-10) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

- 5 This step applies only if a new common power source with battery backup connected to a QBL12, QBL15 or QCA13 battery distribution box is to be used.

Note: This step does not apply if the common power source uses an MFA150 rectifier.

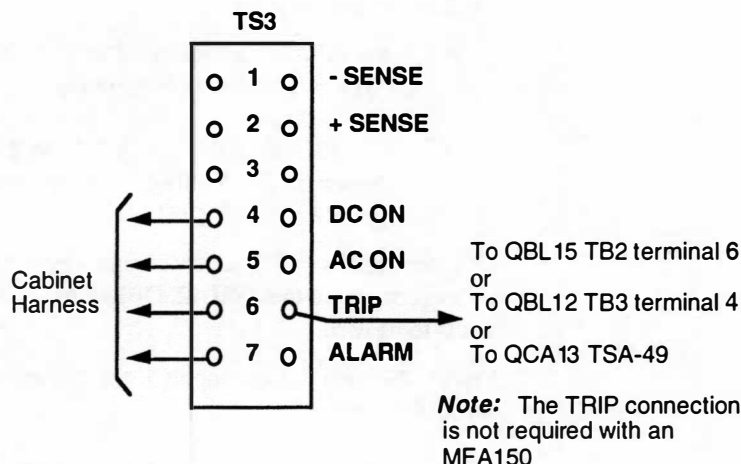
A TRIP lead must be connected to the TRIP connection on:

- the TRIP terminal on the terminal strip on the rectifier in existing cabinets equipped with a rectifier.
- the TRIP terminal of TS3 in existing cabinets not equipped with a rectifier.

The TRIP leads must be connected as follows.

If the existing rectifier is being removed from the cabinet, make the following wiring changes.

- a) If not already connected to TS3, tag and move the cabinet harness DC ON, AC ON, TRIP and ALARM leads presently connected on the rectifier to TS3 as shown in the above drawing. Depending on the type of existing cabinet, the TS3 is located either on the cabinet's TBC block, or on the QUT3 power unit.



- b) Install and connect a 16 AWG wire from terminal 6 (TRIP) on TS3 to the TRIP connection in the QBL12, QBL15 or QCA13 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connections in each cabinet with 16 AWG wire.
- c) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.

Note: The DC ON, AC ON and ALARM lead functions are performed by the Meridian 1 module. Leaving these leads connected in the existing cabinets only extends the alarm indicators to the QPC84 power monitors. If you wish, you may leave these leads disconnected. However, the TRIP lead must be connected.

If the existing rectifier is to remain in the cabinet, make the following wiring changes.

- a) Install and connect a 16 AWG wire from the TRIP connection on the terminal strip of the rectifier to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connection on the terminal strip of the rectifier in each cabinet with 16 AWG wire. In existing cabinets not equipped with a rectifier (such as a QCA7 cabinet powered by a QCA8 cabinet), 'daisy chain' to the TRIP connection on TS3.
 - b) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.
- 6 Cross-connect the alarm cables as shown in Figure 4-11.
 - 7 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.
 - 8 Connect the NT8D86 cables (if provided) or NT8D73 shielded network cables from the Option 21E to the connector on the faceplate of the Peripheral Buffer circuit card in the existing cabinets.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable. The NT8D73 shielded cable can be connected directly to the connector of the Peripheral Buffer card.

—OR—

If the existing cabinet is equipped to suppress EMI, the NT8D73 shielded cable should be connected to its assigned filter connector. See 553-3001-150, *Upgrade Engineering* for more information.

- 9 Remove the QPC84 Power Monitor from the QCA37 cabinet and set switch C11, positions 2 to ON. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required. Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.

Note: Disregard any remaining alarm indications. Alarm indications should return to normal once the upgrade is completed and equipment that is no longer required has been removed as described later in this chapter.

- 10 Restore power to the cabinets and column by reinserting the removed fuse and resetting all circuit breakers to ON.

CAUTION

Do not remove the NT8D22 system monitor (XSM) from the column while the system is in service. Removing the XSM may cause the input circuit breakers on the existing cabinets to trip.

- 11 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Figure 4-10
NT8D46 cable types

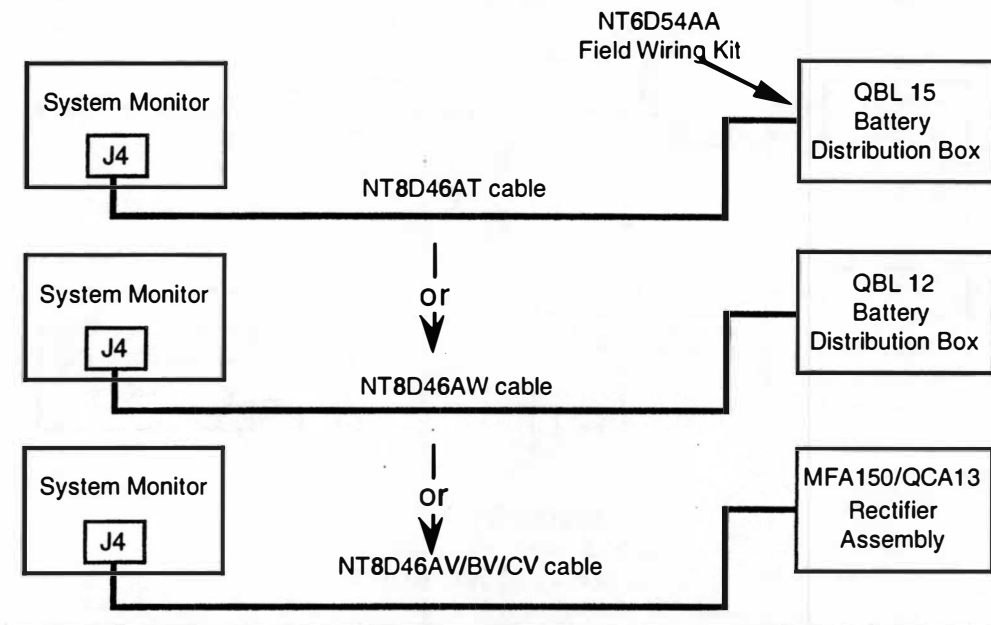
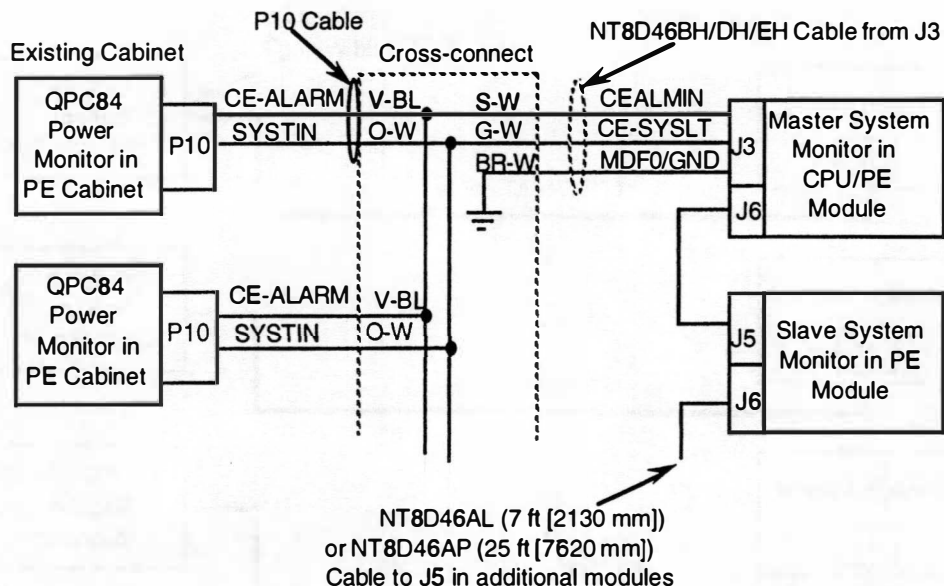


Figure 4-11
Connecting alarm cables between a cabinet and a column



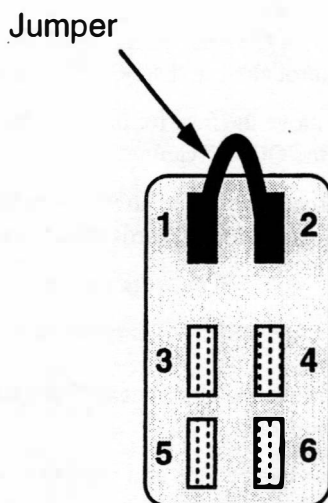
Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

Removing equipment no longer required

The following procedure describes how to remove the equipment that is no longer required once the Option 21E is operating normally.

- 1 Set the CE shelf circuit breakers CB1 and CB2 on the QSD23 power control shelf in the QCA37 cabinet to OFF.
- 2 Remove the fuse for the tape unit from the QSD23 power control shelf in the QCA37 cabinet.
- 3 Disconnect and remove cables from connectors on the faceplate of the following circuit cards located on the CE shelf:
 - QPC376 network circuit cards.
 - QPC139 SDI2 circuit cards, if equipped.
- 4 Remove the circuit cards from the QSD26 CE shelf and store them in a safe place.
- 5 Remove the tape unit from the cabinet.
- 6 If you are using the CE shelf for DTI/PRI cards:
 - Install DTI/PRI cards in the CE shelf.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the CPU/Network module of the Option 21 upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breaker for the CE shelf on the QSD23 power control shelf to ON.
- 7 If you are not going to use the CE shelf for DTI/PRI cards:
 - Disconnect power connectors and alarm connectors from the QSD26 shelf. Tape all exposed power leads with electrical insulation tape.
 - Disconnect all CE alarm connectors.
 - Disconnect and remove the QUD9 cooling unit. Place a jumper (a piece of 24 or 26 AWG bare wire or a paper clip can be used) across power monitor leads 1 and 2 of the cooling unit power connector as shown in Figure 4-12. This disables the alarm for the removed unit.

Figure 4-12
Cooling unit alarm connection



Cooling unit connector on
cabinet power distribution harness

SL-1 QCA58 or QCA96 cabinet upgrade to Meridian 1 Option 21E

This procedure is used to upgrade an SL-1 QCA58 or QCA96 cabinet (N) to Meridian 1 Option 21E. To upgrade to a Meridian 1 Option 21E system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 21E:

1) **In-house software conversion**

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 21E operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) **Manual data entry**

With this method, the database is re-entered manually once the Option 21E is operating with the new software provided with the Option 21E.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 21E operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Modular upgrade of SL-1 QCA58 or QCA96 to Meridian 1 Option 21E

Equipment required

Table 5-1 lists minimum hardware requirements needed to modular upgrade a QCA58 or QCA96 cabinet to a Meridian 1 Option 21E.

Table 5-1
Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT6D43AA or NT7D04AA Rls 3	CE/PE power supply DC
		NT7D00AA	Top cap AC
1	1	NT7D00BA Rls 2	Top cap DC
	1	NT7D09CA	Pedestal DC
1		NT7D14AA or NT8D29AA Rls 4	CE/PE power supply AC
		NT8D11AB Rls 2	CE/PE module AC
1	1	NT8D11DC	CE/PE module DC
		NT8D27AB Rls 3	Pedestal AC
1	1	NT8D22AC	System monitor
1		NT8D52AA	Pedestal blower unit AC
1	1	NT8D52DC	Pedestal blower unit DC (DC system)
		NT8D53AB Rls 5	Power distribution AC
-continued-			

Table 5-1 (continued)**Minimum hardware requirements for a Meridian 1 Option 21E**

Quantity			
AC system	DC system	Part Number	Description
1	1	NT8D17AA Rls 9	Conference/TDS circuit card
1	1	NT8D18AA Rls 9	Digitone Receiver Network card
1	1	NT8D41AA Rls 2	2 Port SDI Paddle Board
1	1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	1	NT8D46AL	System monitor serial link cable
1	1	NT8D46BH	System monitor to SDI cable
1	1	NT8D82	MSPS to I/O cable
3	3	NT8D84AA	SDI Paddle Board to I/O Cable
1	1	NT8D95AJ	SDI I/O panel to DTE/DCE, 16 ft (4875 mm)
1	1	NT9D33AA	Small System Multi-Drive Unit (SMDU)
1	1	NT9D34AA	Enhanced Multi-Drive System Interface (EMSI)
1	1	NT9D47AB or	EMSI to SMDU Data Cable, 2 ft (610mm)
1	1	NT9D47AD	EMSI to SMDU Data Cable, 6 ft (1830mm)
1	1	NT9D66AB or	EMSI to SMDU Power Cable, 2 ft (610mm)
1	1	NT9D66AD	EMSI to SMDU Power Cable, 6 ft (1830mm)
1	1	NTND01CA	12MB CPU/Memory Card
1	1	NTND02BA Rls 2	Misc, Dual SDI Peripheral Signaling Pack with Battery (MSPS)
1	1	NTND31AA Rls 3	ROM daughter board
1	1	NTND37AA	MSPS I/O to DTE/DCE cable 8 ft (2440 mm)
1	1	QPC84Q	Power Monitor

Note: The vintages shown on circuit cards in Table 5-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA58 and QCA96 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 21E Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 21E to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 21E to the existing cabinet.
- A second NT8D86 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Note: The second NT8D86 cable is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as a QCA7 or 8) do not require the second NT8D86 cable since the NT8D73 cable can be connected directly to the Peripheral Buffer connector. For existing cabinets equipped to suppress EMI, refer to 553-3001-150, *Upgrade Engineering*.

Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 21E system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

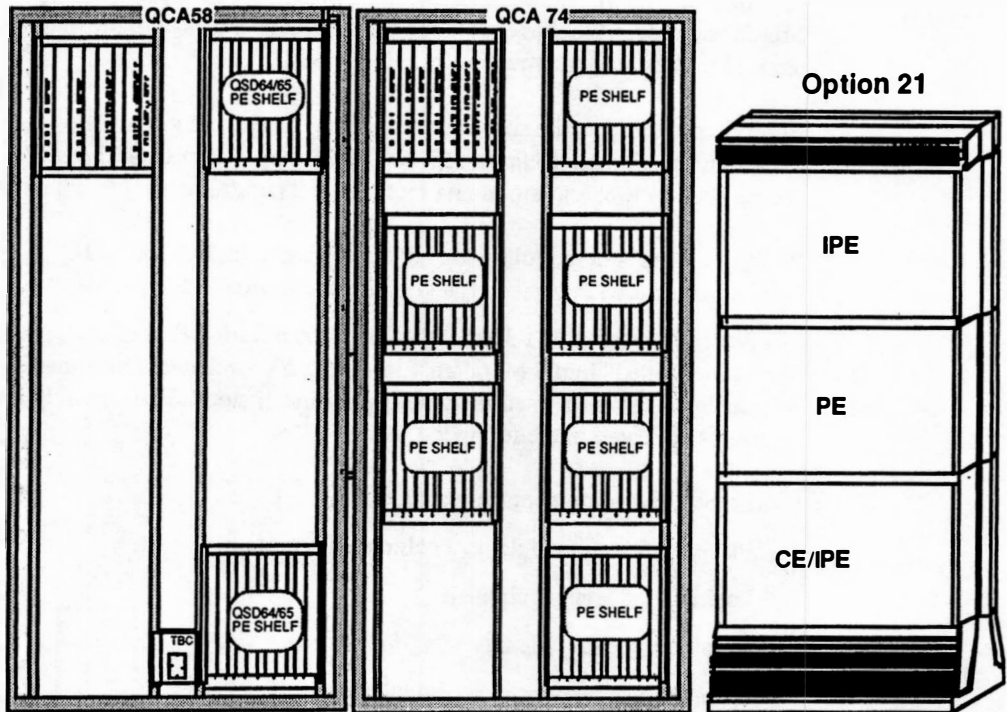
Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 5-1 shows a typical QCA58 cabinet and Figure 5-2 shows a QCA58 cabinet that has been upgraded to Meridian 1 Option 21E.



Figure 5-2

Typical QCA58 cabinet that has been upgraded to Meridian 1 Option 21E



Installing the Meridian 1 Option 21E system

The Option 21E equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, CPU/Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 21E equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 5-2 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.

- Install cabling:
 - Cable common equipment
 - Cable network loops (within the Option 21E columns only).

Note: Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.

 - Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 21E equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 5-3 shows Option 21E circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 5-2**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 5-2 (continued)
NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 5-2 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves				Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."					
For each slave, indicates the slave address				Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."					
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master		on						
	slave		off						
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

Table 5-2 (continued)

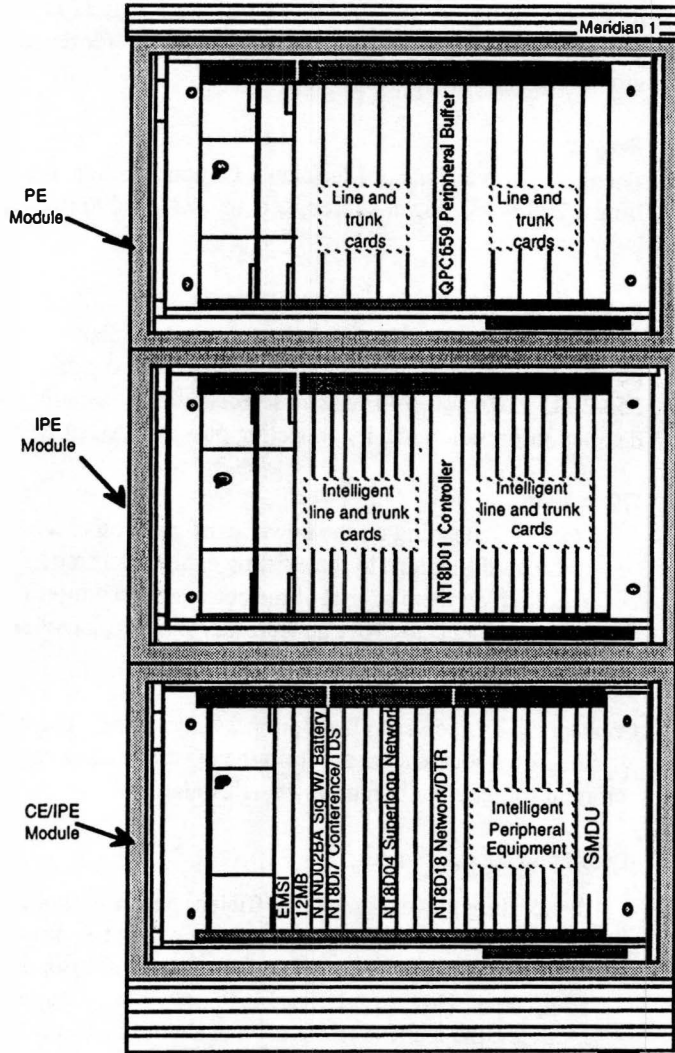
NT8D22 system monitor — settings for total number of slaves — SW2 on master

How many slave units		Switch position						How many slave units		Switch position					
		3	4	5	6	7	8			3	4	5	6	7	8
0		on	on	on	on	on	on	32		off	on	on	on	on	on
1		on	on	on	on	on	off	33		off	on	on	on	on	off
2		on	on	on	on	off	on	34		off	on	on	on	off	on
3		on	on	on	on	off	off	35		off	on	on	on	off	off
4		on	on	on	off	on	on	36		off	on	on	off	on	on
5		on	on	on	off	on	off	37		off	on	on	off	on	off
6		on	on	on	off	off	on	38		off	on	on	off	off	on
7		on	on	on	off	off	off	39		off	on	on	off	off	off
8		on	on	off	on	on	on	40		off	on	off	on	on	on
9		on	on	off	on	on	off	41		off	on	off	on	on	off
10		on	on	off	on	off	on	42		off	on	off	on	off	on
11		on	on	off	on	off	off	43		off	on	off	on	off	off
12		on	on	off	off	on	on	44		off	on	off	off	on	on
13		on	on	off	off	on	off	45		off	on	off	off	on	off
14		on	on	off	off	off	on	46		off	on	off	off	off	on
15		on	on	off	off	off	off	47		off	on	off	off	off	off
16		on	off	on	on	on	on	48		off	off	on	on	on	on
17		on	off	on	on	on	off	49		off	off	on	on	on	off
18		on	off	on	on	off	on	50		off	off	on	on	off	on
19		on	off	on	on	off	off	51		off	off	on	on	off	off
20		on	off	on	off	on	on	52		off	off	on	off	on	on
21		on	off	on	off	on	off	53		off	off	on	off	on	off
22		on	off	on	off	off	on	54		off	off	on	off	off	on
23		on	off	on	off	off	off	55		off	off	on	off	off	off
24		on	off	off	on	on	on	56		off	off	off	on	on	on
25		on	off	off	on	on	off	57		off	off	off	on	on	off
26		on	off	off	on	off	on	58		off	off	off	on	off	on
27		on	off	off	on	off	off	59		off	off	off	on	off	off
28		on	off	off	off	on	on	60		off	off	off	off	on	on
29		on	off	off	off	on	off	61		off	off	off	off	on	off
30		on	off	off	off	off	on	62		off	off	off	off	off	on
31		on	off	off	off	off	off	63		off	off	off	off	off	off
— continued —															

Table 5-2 (continued)

NT8D22 system monitor — slave address — SW2 on slave

Slave unit address							Position						
	3	4	5	6	7	8		3	4	5	6	7	8
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
32	off	on	on	on	on	on							

Figure 5-3**Meridian 1 Option 21E CPU/IPE module with IPE and PE modules**

Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 21E: one designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 21E, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Note: Depending on the power configuration used it may be required to do modifications to the existing cabinets. If modifications are required, do them as part of the cut-over procedures (described later in this document) to avoid unnecessary interruption of service to the end users.

Connect the DC power to the Option 21E columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 21E equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 21E module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 21E modules.

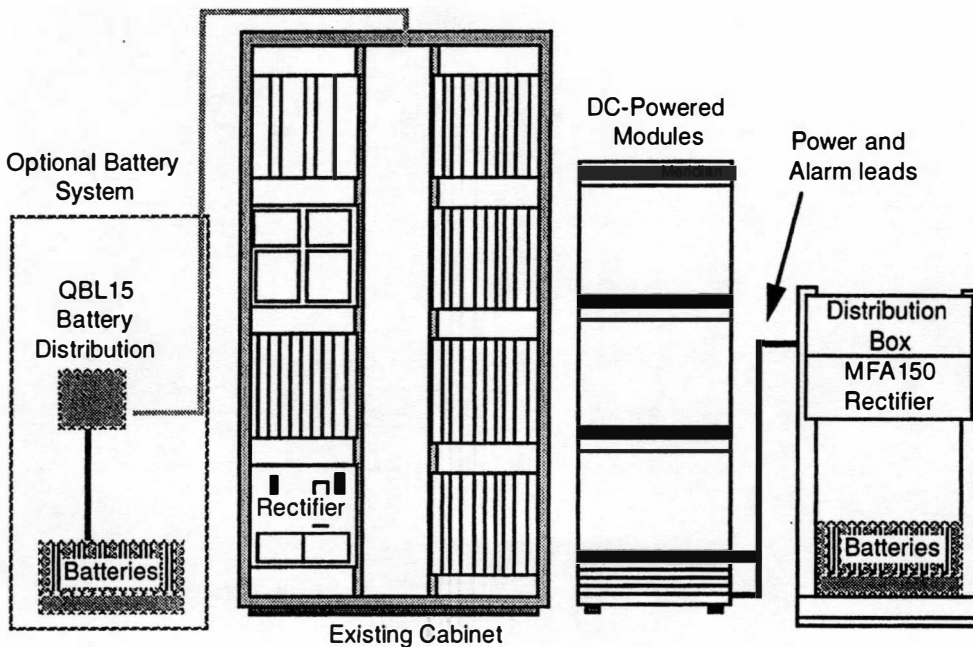
- a new power source installed in conjunction with the Option 21E.

To determine the power requirements for the Option 21E system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 5-4 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 21E modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 21E column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 5-4
Typical arrangement of independently DC-powered Meridian 1 Option 21E modules



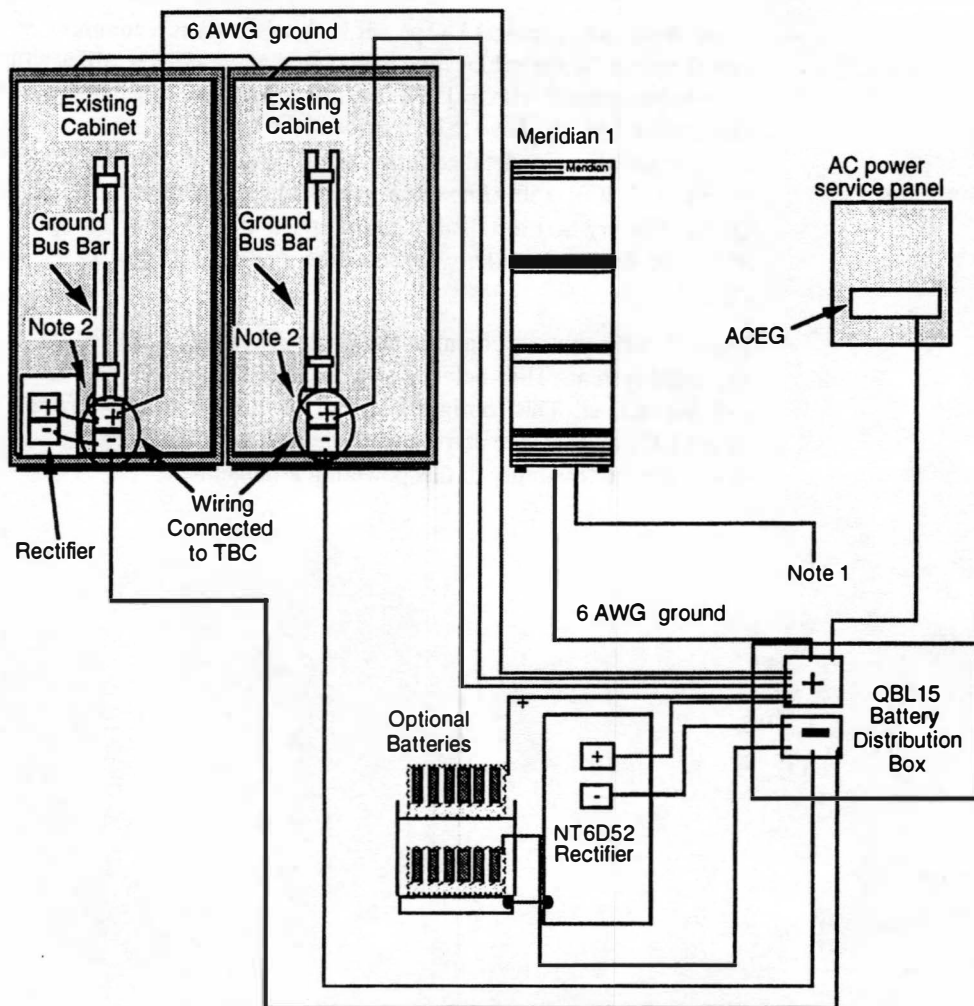
Note: An MFA150 cannot share a battery string connected to QBL15, QBL12 or QCA13. A separate battery string is required for the MFA150.

Common power source

Existing cabinet rectifier as a common power source

- When the existing cabinet DC power source is used as a common power source for the cabinet and the column, any QSD4 rectifier will have to be replaced with a QRF8 rectifier and the existing battery distribution box will have to be replaced with a QBL15 battery distribution box. For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 5-5 illustrates a common power supply arrangement for the upgraded system. This includes both Option 21E modules and the existing cabinet. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

Figure 5-5
Typical arrangement using a common DC power supply with optional battery backup



Note 1: DC power feeds from the QBL15 to the Meridian 1. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

Note 2: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

Customer provided power as a common power source

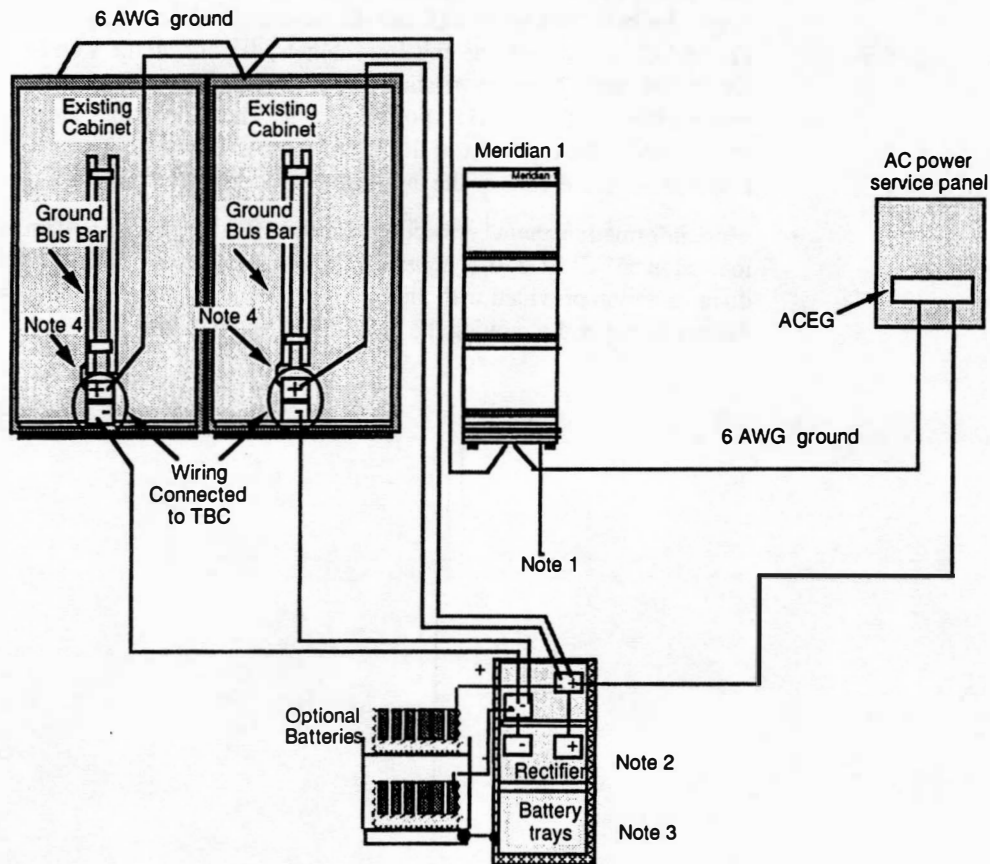
- A QBL12 Battery Distribution Box is normally used to connect to a customer provided DC power source. Figure 5-6 illustrates a customer provided common power supply arrangement for the upgraded system. This includes both Option 21E modules and the existing cabinet. A full description of QBL12 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

An MFA150 power system as a common power source

- An MFA150 power system assembly can be used as a common power source for both the Option 21E and the existing cabinets as shown in Figure 5-7. To connect the existing cabinets, disconnect the + and - 48V power leads from the existing power source, then reroute and connect them to the MFA150 power system. The connections are located under the top cover of the MFA150 power system. The connections at the TBC of the existing cabinet do not change.
- More information about connections for the MFA150 power system is located in 553-3001-210, *System installation procedures*. Refer to the documentation provided with the existing system for information about disconnecting and removing the old rectifier and batteries.

Figure 5-7

Typical arrangement using an MFA150 power system as a common power source



Note 1: DC power feeds from the MFA150 to the Meridian 1. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

Note 2: The MFA150 power system may be equipped with one or two power shelves for a maximum of 75 amps or 150 amps respectively.

Note 3: Batteries may be installed in two optional battery trays located under the rectifier shelves.

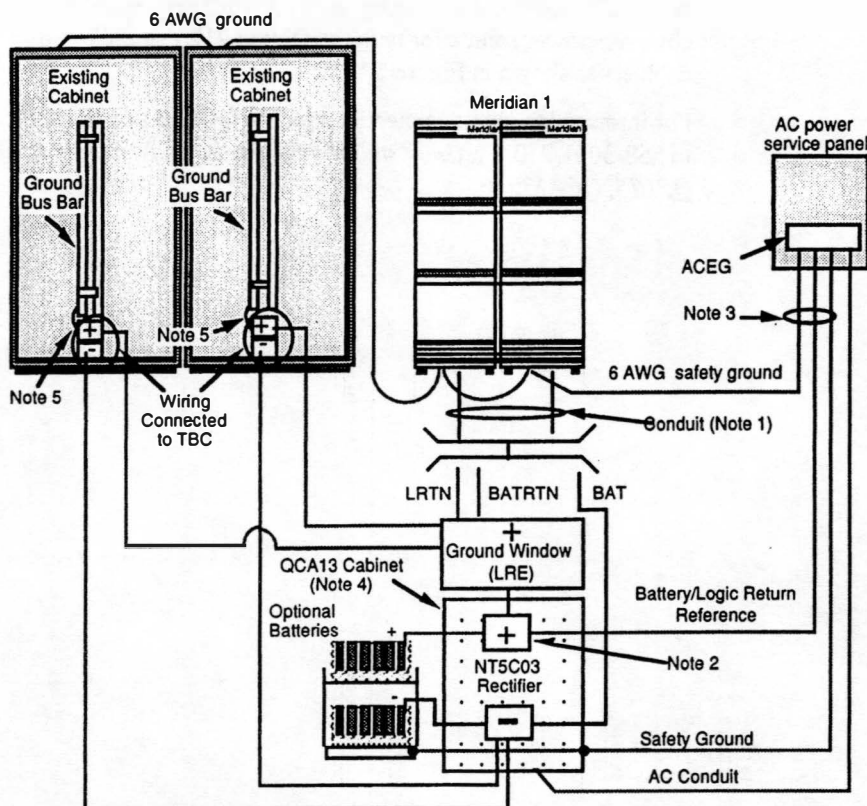
Note 4: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

An existing QCA13 power cabinet as a common power source

- A QCA13 power cabinet equipped with rectifiers can be used as a common power source for both the Option 21E and the existing cabinets as shown in Figure 5-8.
- For information about connections for the QCA13 power cabinet, refer to 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 5-8
Typical arrangement using a QCA13 as a common power source



Note 1: DC power feeds to Meridian 1 pedestals. Each feed consists of two BAT (-), two BATRTN (+), and one LRTN (+) conductors. If required, conductors can be run in conduit as shown. BAT (-) connects to the appropriate fuse in the rectifier cabinet.

Note 2: The QCA13 cabinet does not contain a bus for terminating individual battery and logic returns. A ground window should be used to consolidate all battery and logic returns.

Note 3: The Battery/Logic Return Reference wiring and the safety ground wiring must be #6 AWG, minimum.

Note 4: Up to four NT5C03 rectifiers can be equipped in a QCA13 cabinet for a total of 200 amps.

Note 5: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 21E modules.

These cables connect the System Monitor to the SDI Paddle Board in the CPU/Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section 'Separate power source' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 5-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the new system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 21E system:

- 1 Power up and initially load the Option 21E column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.
- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
- 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
- 4 The Meridian 1 Option 21E system is now operational.

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 21E column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 Connect an NT8D86 cable between the connector on the faceplate of the network card and the I/O panel of the Option 21E. One cable is required for each network loop.
- 2 Connect an NT8D73 shielded cable, up to 30 ft (9 m) in length, to the connector on the I/O panel of the Option 21E. Route the NT8D73 cable to the existing cabinet. Do not connect it to the Peripheral Buffer card in the existing cabinet at this time.

Note: Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

- 3 If required in the existing cabinet (see Note) connect an NT8D86 cable to the connector on the NT8D73 shielded cable from the Option 21E. Make sure that the connectors are locked together with the locking devices. Do not connect the cable to the faceplate of the Peripheral Buffer card at this time. It will be connected as part of the cutover procedure.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable.

Cutting-over

The following procedure describes how to cut-over to the Option 21E system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL12 or QCA13 unit**
Remove the fuses from the -48V fuse panel corresponding to each cabinet and column.
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.

Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.
 - **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
 - **AC powered modules**
Set the AC power supply breaker at the AC power service panel to OFF.
- 2 If required, perform power modifications to the existing cabinets as described in step 3.
- 3 In the existing cabinets, remove the wiring connecting the frame of the cabinet to the positive (+) connection of the TBC, and the wiring connecting the frame to the cabinet ground bus bar. Refer to Figures 5-6 through 5-8.

Note: This wiring was factory installed. It must be removed to avoid ground loops when existing cabinets are used with Meridian 1 modules.

- 4 This step applies only to Meridian 1 modules connected to a DC power source.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 5-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12 or QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

- 5 This step applies only if a new common power source with battery backup connected to a QBL12, QBL15 or QCA13 battery distribution box is to be used.

Note: This step does not apply if the common power source uses an MFA150 power system.

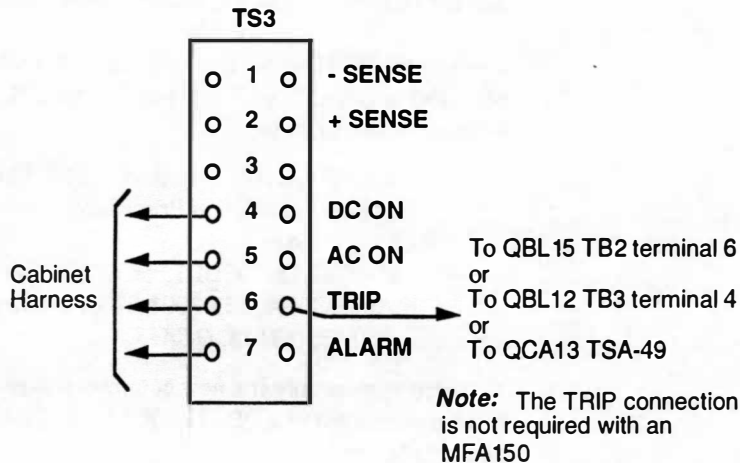
A TRIP lead must be connected to the TRIP connection on:

- the TRIP terminal on the terminal strip on the rectifier in existing cabinets equipped with a rectifier.
- the TRIP terminal of TS3 in existing cabinets not equipped with a rectifier.

The TRIP leads must be connected as follows.

If the existing rectifier is being removed from the cabinet, make the following wiring changes.

- a) If not already connected to TS3, tag and move the cabinet harness DC ON, AC ON, TRIP and ALARM leads presently connected on the rectifier to TS3 as shown in the above drawing. Depending on the type of existing cabinet, the TS3 is located either on the cabinet's TBC block, or on the QUT3 power unit.



- b) Install and connect a 16 AWG wire from terminal 6 (TRIP) on TS3 to the TRIP connection in the QBL12, QBL15 or QCA13 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connections in each cabinet with 16 AWG wire.
- c) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.

Note: The DC ON, AC ON and ALARM lead functions are performed by the Meridian 1 module. Leaving these leads connected in the existing cabinets only extends the alarm indicators to the QPC84 power monitors. If you wish, you may leave these leads disconnected. However, the TRIP lead must be connected.

If the existing rectifier is to remain in the cabinet, make the following wiring changes.

- a) Install and connect a 16 AWG wire from the TRIP connection on the terminal strip of the rectifier to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connection on the terminal strip of the rectifier in each cabinet with 16 AWG wire. In existing cabinets not equipped with a rectifier (such as a QCA7 cabinet powered by a QCA8 cabinet), 'daisy chain' to the TRIP connection on TS3.
 - b) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.
- 6 Remove the QPC84 Power Monitor from the QCA58 or QCA96 cabinet and set switch C11, position 2 to ON. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required.
Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.
- Note:** Disregard any remaining alarm indications. Alarm indications should return to normal once the upgrade is completed and equipment that is no longer required has been removed as described later in this chapter.
- 7 Cross-connect the alarm cables as shown in Figure 5-10.
- 8 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.

- 9 Connect the NT8D86 cables (if provided) or NT8D73 shielded network cables from the Option 21E to the connector on the faceplate of the Peripheral Buffer circuit card in the existing cabinets.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable. The NT8D73 shielded cable can be connected directly to the connector of the Peripheral Buffer card.

—OR—

If the existing cabinet is equipped to suppress EMI, the NT8D73 shielded cable should be connected to its assigned filter connector. See 553-3001-150, *Upgrade Engineering* for more information.

- 10 Restore power to the cabinets and column by reinserting the removed fuse and resetting all circuit breakers to ON.

CAUTION

Do not remove the NT8D22 system monitor (XSM) from the column while the system is in service. Removing the XSM may cause the input circuit breakers on the existing cabinets to trip.

- 11 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Figure 5-9
NT8D46 cable types

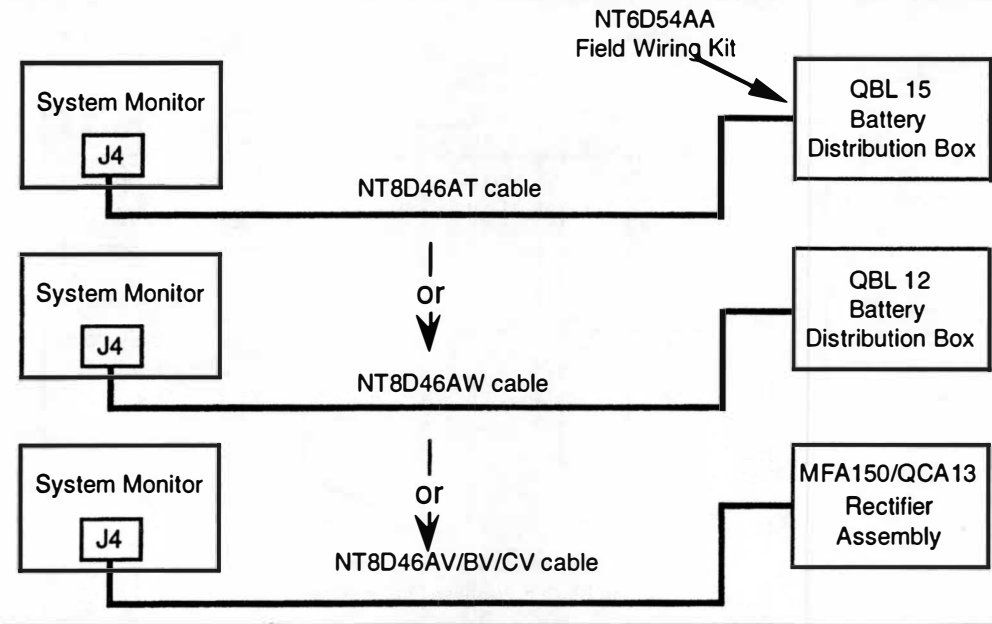
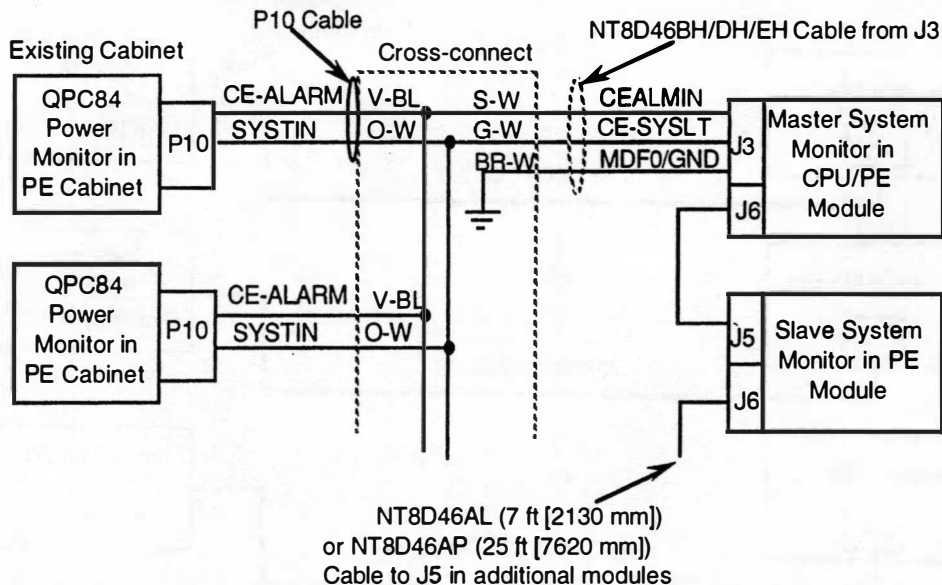


Figure 5-10

Connecting alarm cables between a cabinet and a column



Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

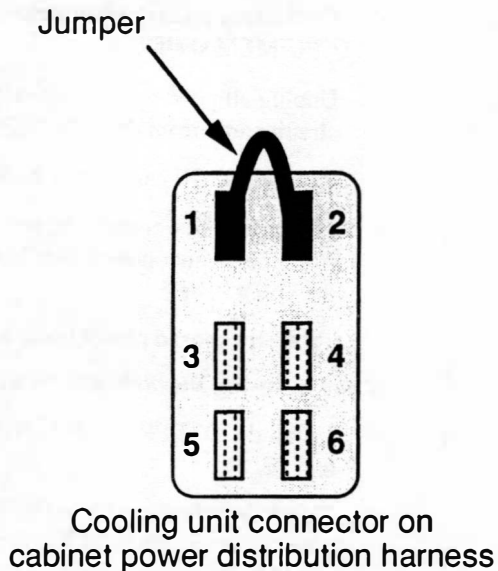
Removing equipment no longer required

The following procedure describes how to remove the equipment that is no longer required once the Option 21E is operating normally.

- 1 Set the circuit breakers for the CPU/MEM and Network shelves in the QCA58 or QCA96 cabinet to OFF.
- 2 Remove the fuse for the tape unit in the QCA58 or QCA96 cabinet.
- 3 Disconnect the cables from the faceplate connectors on all the circuit cards located in the CPU/MEM and Network shelves in the QCA58 or QCA96 cabinet.
- 4 Remove circuit cards from the CE/MEM and Network shelves in the QCA58 or QCA96 cabinet and store them in a safe place.
- 5 Disconnect the Tape Unit or the Mass Storage Unit power monitor and alarm connectors. To do this, you must first remove the Tape Unit or the Mass Storage Unit and then disconnect these connectors. Remove the tape or mass storage unit from the cabinet. Tape all exposed power leads with electrical insulation tape.
- 6 Disconnect power and alarm connections:
 - Disconnect all alarm connectors from the harness to the CPU/MEM shelf.
 - Unplug all power converter cards and all common equipment circuit cards from the CPU/MEM shelf.
 - Remove all CE cards from the Network shelves.
 - Disconnect power connections and the power monitor connector from the cabinet power distribution harness of the backplane on the QSP41 shelf.
 - Tape all exposed power leads with electrical insulation tape.
- 7 If you are using Network shelves for DTI/PRI cards:
 - Install the DTI/PRI cards in Network shelf card slots 2, 4, 6, 8, 10, and 12.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the CPU/Network module of the Option 21 upgrade column to obtain clock reference for the DTI/PRI cards.
 - Set circuit breakers for the Network shelves to ON.

- 8 If you are not going to use Network shelves for DTI/PRI cards:
- Disconnect alarm connectors from the harness to Network shelves.
 - Unplug all power converter cards from each Network shelf.
 - Disconnect power connections and power monitor connector from the cabinet power distribution harness to the backplane on QSD39 and QSD40 shelves.
 - Tape all exposed power leads with electrical insulation tape.
 - Remove shelves.
 - Disconnect and remove the QUD20 cooling unit. Place a jumper (a piece of 24 or 26 AWG bare wire or a paper clip can be used) across power monitor leads 1 and 2 of the cooling unit power connector as shown in Figure 5-11. This disables the alarm for the removed cooling unit.

Figure 5-11
Cooling unit alarm connection



SL-1 QCA60 cabinet upgrade to Meridian 1 Option 21E

This procedure is used to upgrade an SL-1 QCA60 cabinet (S, ST or 21) to Meridian 1 Option 21E. To upgrade to a Meridian 1 Option 21E system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 21E:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 21E operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 21E is operating with the new software provided with the Option 21E.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 21E operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Hardware upgrade methods

There are two methods of upgrading a QCA60 cabinet to a Meridian 1 Option 21E:

- 1 If the CPU shelf has been previously upgraded to a ST or 21 then either the card level or modular upgrade may be performed.
- 2 If the CPU shelf has not been previously upgraded then a modular upgrade must be done.

Card upgrade of an SL-1 QCA60 cabinet (ST or 21) to Meridian 1 Option 21E

Equipment required

Table 6-1 lists minimum hardware requirements needed for a card level upgrade of a QCA60 cabinet to a Meridian 1 Option 21E.

Table 6-1
Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT9D33AA	Small System Multi-Drive Unit (SMDU)
1	1	NT9D34AA	Enhanced Multi-Drive System Interface (EMSI)
	1	NT9D47AB	EMSI to SMDU Data Cable, 2 ft (610mm)
1	1	or NT9D47AD	EMSI to SMDU Data Cable, 6 ft (1830mm)
1	1	NT9D66AB	EMSI to SMDU Power Cable, 2 ft (610mm)
1	1	or NT9D66AD	EMSI to SMDU Power Cable, 6 ft (1830mm)
1	1	NTND01CA	12MB CPU/Memory Card
1	1	NTND02BA Rls 2	Misc, Dual SDI Peripheral Signaling Pack with Battery (MSPS)
1	1	NTND31AA Rls 3	Daughter board (ROM)

Note: The vintages shown on circuit cards in Table 6-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

Summary of steps to upgrade

Upgrading consists of:

- removal of CPU/MEM, PS, FDI and FDU
- installation of Option 21E cards and cables
- sysload

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

Removal of CPU/MEM, PS, FDI and FDU

To remove cards:

- 1 Remove software disks from the Floppy Disk Unit.
- 2 Disconnect the cable from the faceplate of the FDI and FDU.
- 3 Set the ENB/DIS switches on cards located in slots 1, 2, 3 and 4 to DIS.
- 4 Remove the Floppy Disk Unit and cards located in slots 1, 2, 3 and 4.

Installation of Option 21E equipment

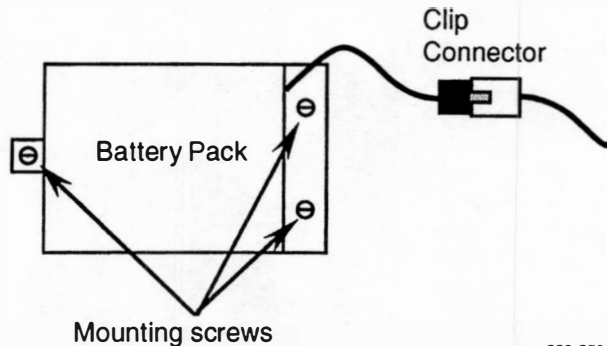
To install Option 21E cards and cables:

- 1 Set the ENB/DIS switch on the NT9D34 EMSI card to DIS.
- 2 Mount the appropriate software cartridge on the EMSI card and set option switches 1, 5, 7 and 8 to ON.
- 3 Install EMSI card in card slot 3 and set the ENB/DIS switch to ENB.
- 4 Install the NTND31AA ROM card onto the NTND01CA CPU/Memory card:
 - Carefully plug the ROM card into the pin connector.
 - Install the screw and washer at each corner of the ROM card.
- 5 Install the CPU/Memory card in card slot 2.
- 6 Set the ENB/DIS switch on the MSPS card to DIS.
- 7 Set option switches on the MSPS card to activate SDI ports. To avoid conflicting addresses, determine the appropriate option switch settings, refer to *Circuit card installation and testing* (553-3001-211).

- 8 Connect the battery pack on the NTND02BA MSPS card by plugging the battery clip connector to the clip connector on the board as illustrated in Figure 6-1.

Note: The battery will not be fully charged until 24 hours after installation in a powered system.

Figure 6-1
Battery pack connection to the MSPS



- 9 Install the NTND02BA MSPS card in slot 4.
- 10 Connect the NTND37 Dual SDI cable to the connector on the NTND02BA MSPS faceplate.
- 11 Set the ENB/DIS switch on the NTND02BA MSPS card to ENB.
- 12 Install the NT9D33 SMDU in its assigned position in the CE shelf. The SMDU may be installed in an alternate location such as the old network shelf in position 6 or any available PE slots, provided the NT9D47 and NT9D66 interface cables will reach from the SMDU to the EMSI.

Sysload

Before you sysload the system, review installation steps and verify that all circuit cards are in the appropriate card slots, ENB/DIS switches are set to ENB, and all cables are properly connected.

- 1 To sysload the system insert the floppy disks into disk drives and press Rld on the CPU/MEM card.
- 2 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Module upgrade of an SL-1 QCA60 cabinet (S, ST or 21) to Meridian 1 Option 21E

Equipment required

Table 6-2 lists minimum hardware requirements needed to upgrade a QCA60 cabinet to a Meridian 1 Option 21E.

Table 6-2
Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT6D43AA or NT7D04AA Rls 3	CE/PE power supply DC
		NT7D00AA	Top cap AC
1	1	NT7D00BA Rls 2	Top cap DC
	1	NT7D09CA	Pedestal DC
1		NT7D14AA or NT8D29AA Rls 4	CE/PE power supply AC
1		NT8D11AB Rls 2	CE/PE module AC
	1	NT8D11DC	CE/PE module DC
1		NT8D27AB Rls 3	Pedestal AC
1	1	NT8D22AC	System monitor
1		NT8D52AA	Pedestal blower unit AC
	1	NT8D52DC	Pedestal blower unit DC (DC system)
1		NT8D53AB Rls 5	Power distribution AC
-continued-			

Table 6-2 (continued)
Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT8D17AA Rls 9	Conference/TDS circuit card
1	1	NT8D18AA Rls 9	Digitone Receiver Network card
1	1	NT8D41AA Rls 2	2 Port SDI Paddle Board
1	1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	1	NT8D46AL	System monitor serial link cable
1	1	NT8D46BH	System monitor to SDI cable
1	1	NT8D82	MSPS to I/O cable
3	3	NT8D84AA	SDI Paddle Board to I/O Cable
1	1	NT8D95AJ	SDI I/O panel to DTE/DCE, 16 ft (4875 mm)
1	1	NT9D33AA	Small System Multi-Drive Unit (SMDU)
1	1	NT9D34AA	Enhanced Multi-Drive System Interface (EMSI)
1	1	NT9D47AB or	EMSI to SMDU Data Cable, 2 ft (610mm)
1	1	NT9D47AD	EMSI to SMDU Data Cable, 6 ft (1830mm)
1	1	NT9D66AB or	EMSI to SMDU Power Cable, 2 ft (610mm)
1	1	NT9D66AD	EMSI to SMDU Power Cable, 6 ft (1830mm)
1	1	NTND01CA	12MB CPU/Memory Card
1	1	NTND02BA Rls 2	Misc, Dual SDI Peripheral Signaling Pack with Battery (MSPS)
1	1	NTND31AA Rls 3	ROM daughter board
1	1	NTND37AA	MSPS I/O to DTE/DCE cable 8 ft (2440 mm)
1	1	QPC84Q	Power Monitor

Note: The vintages shown on circuit cards in Table 6-2 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 21E system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 6-2 shows a typical QCA60 cabinet and Figure 6-3 shows a QCA60 cabinet that has been upgraded to Meridian 1 Option 21E.

Figure 6-2
Typical QCA60 cabinet

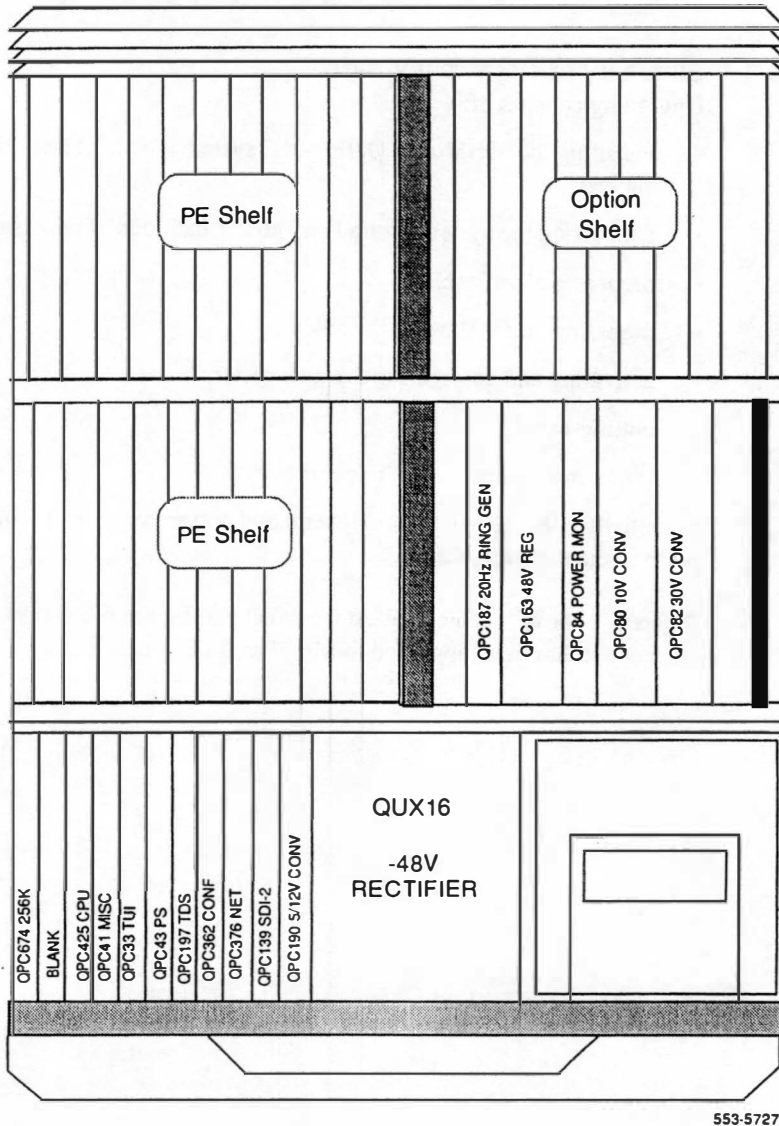
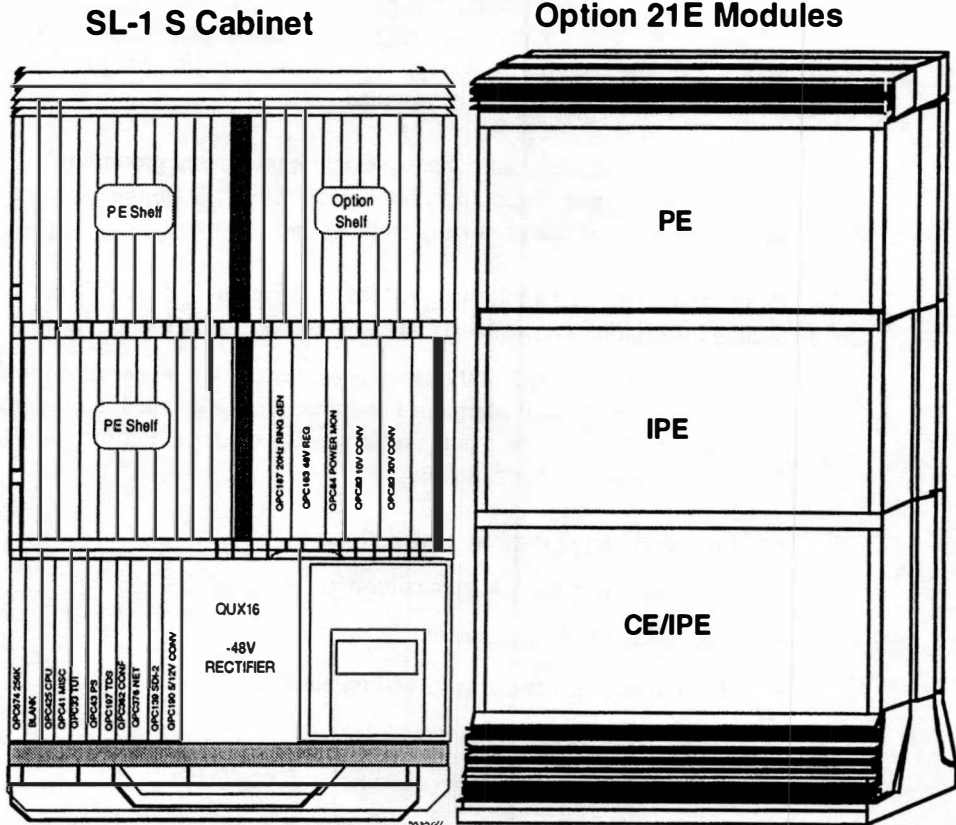


Figure 6-3

Typical QCA60 cabinet that has been upgraded to Meridian 1 Option 21E



Installing the Meridian 1 Option 21E system

The Option 21E equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, CPU/Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 21E equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 6-3 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.

- Install cabling:
 - Cable common equipment
 - Cable network loops (within the Option 21E columns only).

Note: Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.

 - Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 21E equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 6-4 shows Option 21E circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 6-3

NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 6-3 (continued)
NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 6-3 (continued)**NT8D22 system monitor — SW2 and SW3 settings**

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves				Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."					
For each slave, indicates the slave address				Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."					
SW3 Indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master		on						
	slave		off						
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

Table 6-3 (continued)

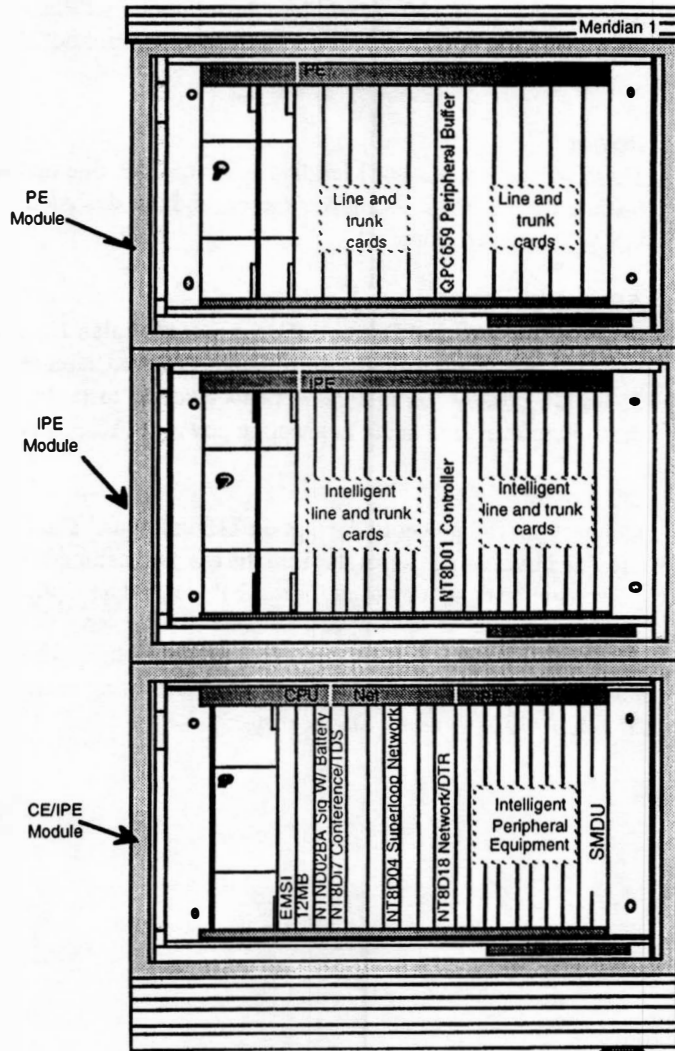
NT8D22 system monitor — settings for total number of slaves — SW2 on master

How many slave units		Switch position						How many slave units		Switch position					
		3	4	5	6	7	8			3	4	5	6	7	8
0		on	on	on	on	on	on	32		off	on	on	on	on	on
1		on	on	on	on	on	off	33		off	on	on	on	on	off
2		on	on	on	on	off	on	34		off	on	on	on	off	on
3		on	on	on	on	off	off	35		off	on	on	on	off	off
4		on	on	on	off	on	on	36		off	on	on	off	on	on
5		on	on	on	off	on	off	37		off	on	on	off	on	off
6		on	on	on	off	off	on	38		off	on	on	off	off	on
7		on	on	on	off	off	off	39		off	on	on	off	off	off
8		on	on	off	on	on	on	40		off	on	off	on	on	on
9		on	on	off	on	on	off	41		off	on	off	on	on	off
10		on	on	off	on	off	on	42		off	on	off	on	off	on
11		on	on	off	on	off	off	43		off	on	off	on	off	off
12		on	on	off	off	on	on	44		off	on	off	off	on	on
13		on	on	off	off	on	off	45		off	on	off	off	on	off
14		on	on	off	off	off	on	46		off	on	off	off	off	on
15		on	on	off	off	off	off	47		off	on	off	off	off	off
16		on	off	on	on	on	on	48		off	off	on	on	on	on
17		on	off	on	on	on	off	49		off	off	on	on	on	off
18		on	off	on	on	off	on	50		off	off	on	on	off	on
19		on	off	on	on	off	off	51		off	off	on	on	off	off
20		on	off	on	off	on	on	52		off	off	on	off	on	on
21		on	off	on	off	on	off	53		off	off	on	off	on	off
22		on	off	on	off	off	on	54		off	off	on	off	off	on
23		on	off	on	off	off	off	55		off	off	on	off	off	off
24		on	off	off	on	on	on	56		off	off	off	on	on	on
25		on	off	off	on	on	off	57		off	off	off	on	on	off
26		on	off	off	on	off	on	58		off	off	off	on	off	on
27		on	off	off	on	off	off	59		off	off	off	on	off	off
28		on	off	off	off	on	on	60		off	off	off	off	on	on
29		on	off	off	off	on	off	61		off	off	off	off	on	off
30		on	off	off	off	off	on	62		off	off	off	off	off	on
31		on	off	off	off	off	off	63		off	off	off	off	off	off
— continued —															

Table 6-3 (continued)
NT8D22 system monitor — slave address — SW2 on slave

Slave unit address							Position							Slave unit address							Position						
							3	4	5	6	7	8								3	4	5	6	7	8		
1	on	on	on	on	on	off	33	off	on	on	on	on	on	off	33	off	on	on	on	on	off	on					
2	on	on	on	on	off	on	34	off	on	on	on	on	off	on	34	off	on	on	on	off	on						
3	on	on	on	on	off	off	35	off	on	on	on	on	off	off	35	off	on	on	on	off	off						
4	on	on	on	off	on	on	36	off	on	on	off	on	on	36	off	on	on	off	on	on							
5	on	on	on	off	on	off	37	off	on	on	off	on	off	37	off	on	on	off	on	off							
6	on	on	on	off	off	on	38	off	on	on	off	off	on	38	off	on	on	off	off	on							
7	on	on	on	off	off	off	39	off	on	on	off	off	off	39	off	on	on	off	off	off							
8	on	on	off	on	on	on	40	off	on	off	on	on	on	40	off	on	off	on	on	on							
9	on	on	off	on	on	off	41	off	on	off	on	on	off	41	off	on	off	on	on	off							
10	on	on	off	on	off	on	42	off	on	off	on	off	on	42	off	on	off	on	off	on							
11	on	on	off	on	off	off	43	off	on	off	on	off	off	43	off	on	off	on	off	off							
12	on	on	off	off	on	on	44	off	on	off	off	on	on	44	off	on	off	off	on	on							
13	on	on	off	off	on	off	45	off	on	off	off	on	off	45	off	on	off	off	on	off							
14	on	on	off	off	off	on	46	off	on	off	off	off	on	46	off	on	off	off	off	on							
15	on	on	off	off	off	off	47	off	on	off	off	off	off	47	off	on	off	off	off	off							
16	on	off	on	on	on	on	48	off	off	on	on	on	on	48	off	off	on	on	on	on							
17	on	off	on	on	on	off	49	off	off	on	on	on	off	49	off	off	on	on	on	off							
18	on	off	on	on	off	on	50	off	off	on	on	off	on	50	off	off	on	on	off	on							
19	on	off	on	on	off	off	51	off	off	on	on	off	off	51	off	off	on	on	off	off							
20	on	off	on	off	on	on	52	off	off	on	off	on	on	52	off	off	on	off	on	on							
21	on	off	on	off	on	off	53	off	off	on	off	on	off	53	off	off	on	off	on	off							
22	on	off	on	off	off	on	54	off	off	on	off	off	on	54	off	off	on	off	off	on							
23	on	off	on	off	off	off	55	off	off	on	off	off	off	55	off	off	on	off	off	off							
24	on	off	off	on	on	on	56	off	off	off	on	on	on	56	off	off	off	on	on	on							
25	on	off	off	on	on	off	57	off	off	off	on	on	off	57	off	off	off	on	on	off							
26	on	off	off	on	off	on	58	off	off	off	on	off	on	58	off	off	off	on	off	on							
27	on	off	off	on	off	off	59	off	off	off	on	off	off	59	off	off	off	on	off	off							
28	on	off	off	off	on	on	60	off	off	off	off	on	on	60	off	off	off	off	on	on							
29	on	off	off	off	on	off	61	off	off	off	off	on	off	61	off	off	off	off	on	off							
30	on	off	off	off	off	on	62	off	off	off	off	off	on	62	off	off	off	off	off	on							
31	on	off	off	off	off	off	63	off	off	off	off	off	off	63	off	off	off	off	off	off							
32	off	on	on	on	on	on																					

Figure 6-4
Meridian 1 Option 21E CPU/IPE module with IPE and PE modules



Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 21E: one that is designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 21E, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

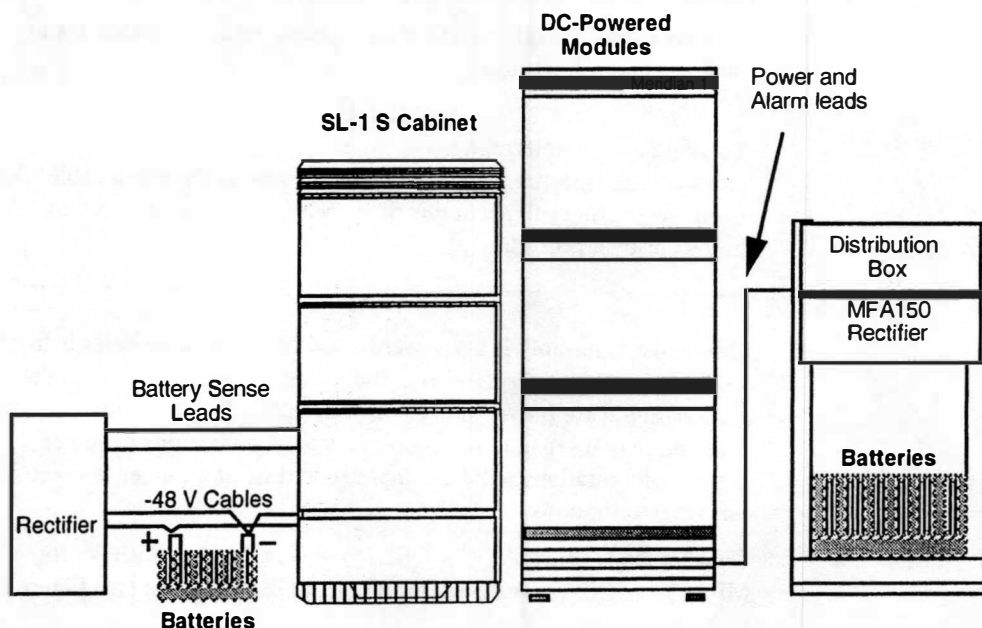
Connect the DC power to the Option 21E columns. The DC power is provided by a source separate from the existing cabinets. A common power source cannot be used for this cabinet and an Option 21E column.

To determine the power requirements for the Option 21E system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 6-5 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 21E modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 21E column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 6-5
Typical arrangement of independently DC-powered Meridian 1 Option 21E modules



Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 21E modules.

These cables connect the System Monitor to the SDI Paddle Board in the CPU/Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

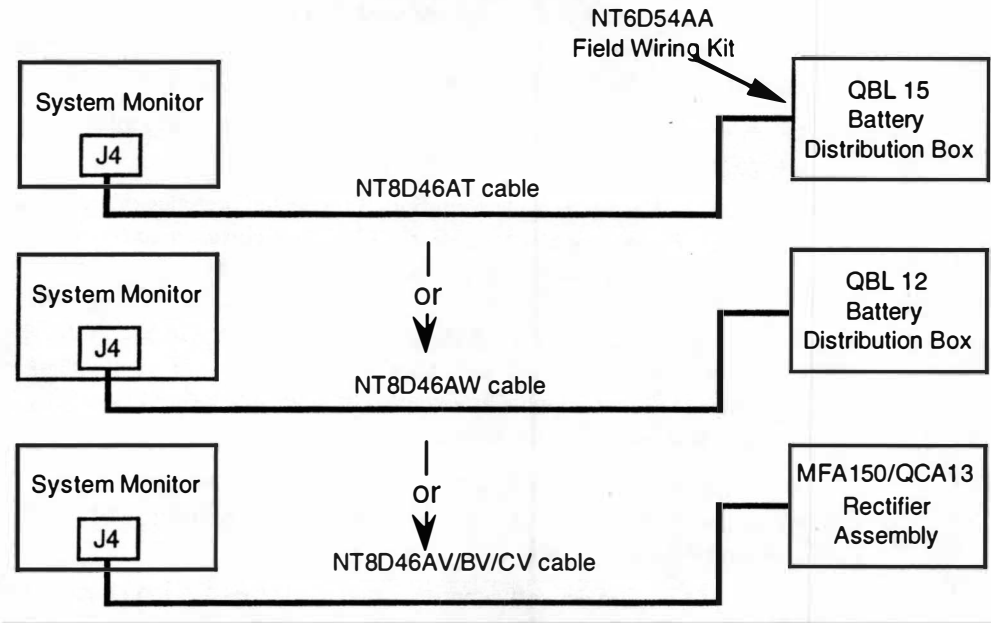
To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section '**Separate power source**' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 6-6) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12 or QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Figure 6-6
NT8D46 cable types



Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 21E system:

- 1 Power up and initially load the Option 21E column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.

- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
- 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
- 4 The Meridian 1 Option 21E system is now operational.

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 21E column.

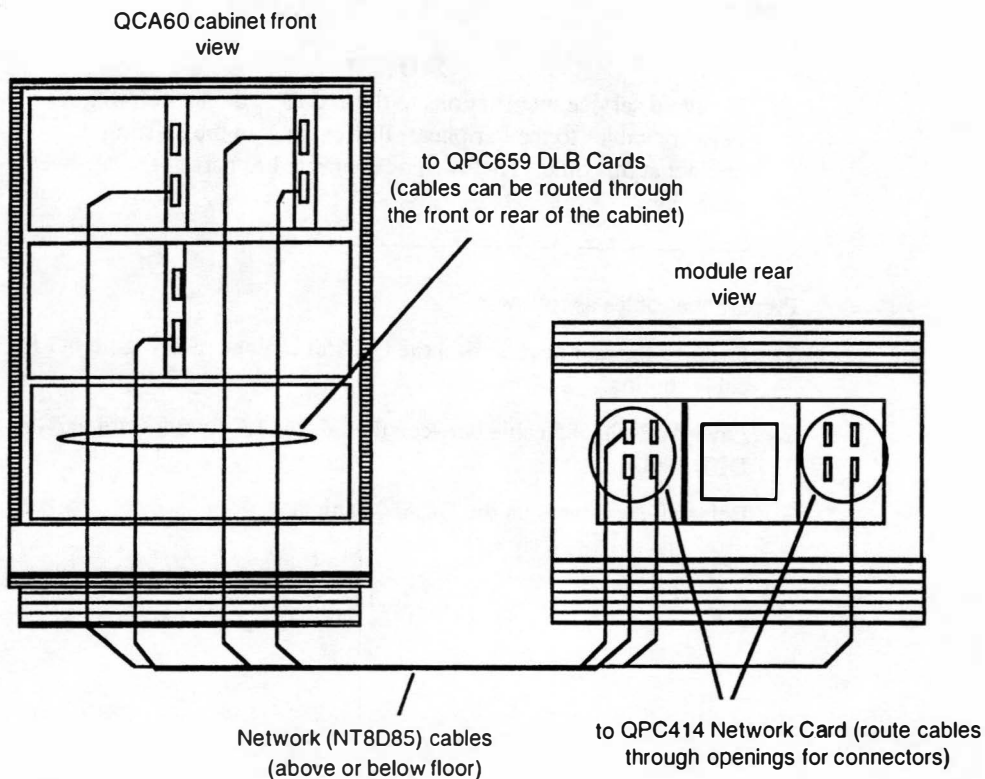
CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1** Remove the rear covers from the QCA60 cabinet. See Figure 6-7 for cable routing.
- 2** Layout a NT8D85 cable between the QPC414 Network Card and the DLB card.
- 3** Reinstall the covers on the QCA60 cabinet.

Figure 6-7
Cable types and their routing (non-EMI suppression applications)



553-3198

Cutting-over

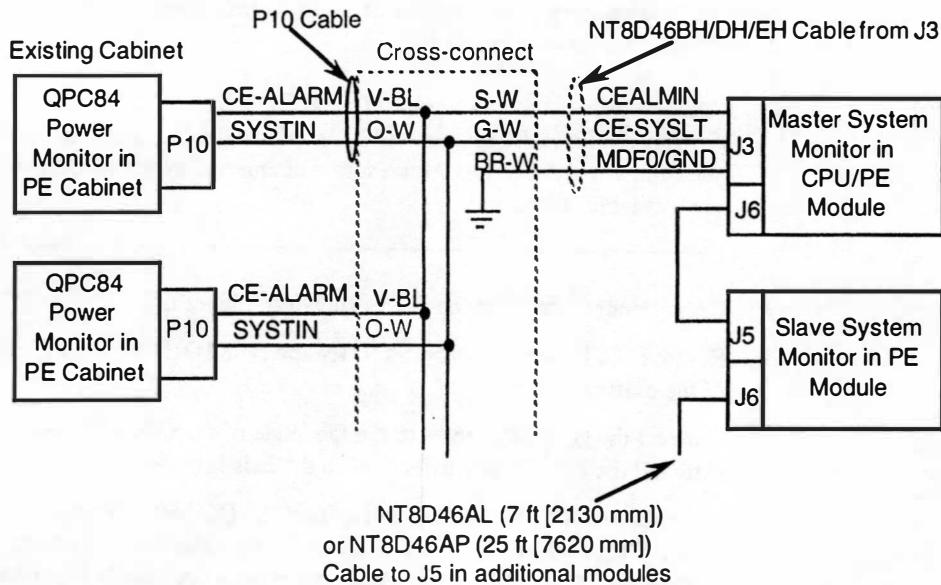
The following procedure describes how to cut-over to the Option 21E system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Cross-connect the alarm cables as shown in Figure 6-8.
- 2 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.
- 3 Connect the NT8D85 cables to the faceplate of the QPC414 Network card and the Peripheral Buffer card in the existing cabinet.
- 4 Remove the QPC84 Power Monitor from the QCA60 cabinet and set switch C11, position 2 to ON. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required. Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.
- 5 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Figure 6-8
Connecting alarm cables between a cabinet and a column



Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

Removing equipment no longer required

The following procedure describes how to remove the equipment that is no longer required once the Option 21E is operating normally.

- 1 Set the CE shelf circuit breaker labeled CB1 on the power control shelf in the QCA60 cabinet to OFF.
- 2 Disconnect and remove cables from connectors on the faceplate of the circuit cards located on the CE shelf.

Note: The main CE shelf is located at the bottom left shelf position in the cabinet (viewed from the front). An optional expansion CE shelf may be located at the top right shelf position.

- 3 Remove the CE circuit cards from the CE shelf and store them in a safe place.
- 4 Disconnect the tape unit connector. To do this, you must first remove the tape unit and then disconnect the alarm connector. Remove the tape unit from the cabinet.
- 5 If you are using the CE shelf for DTI/PRI cards:
 - Install the DTI/PRI cards in cards.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the CPU module of the option 21E upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breaker for the CE shelf on the power control shelf to ON.
- 6 If you are not going to use the CE shelf for DTI/PRI cards unplug and remove the remaining cards from the CE shelf.

SL-1 QCA109 cabinet upgrade to Meridian 1 Option 21E

This procedure is used to upgrade an SL-1 QCA109 cabinet (MS, ST or 21) to Meridian 1 Option 21E. To upgrade to a Meridian 1 Option 21E system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 21E:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 21E operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 21E is operating with the new software provided with the Option 21E.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 21E operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Hardware upgrade methods

There are two methods of upgrading a QCA109 cabinet to a Meridian 1 Option 21E:

- 1 If the CPU shelf has been previously upgraded to a QSD81 (ST or 21) then either the card level or modular upgrade may be performed.
- 2 If the CPU shelf has not been previously upgraded to a QSD81 then a modular upgrade must be done.

Card upgrade of SL-1 QCA109 cabinet (ST or 21) to Meridian 1 Option 21E

Equipment required

Table 7-1 lists minimum hardware requirements needed for a card level upgrade of a QCA109 cabinet to a Meridian 1 Option 21E.

Table 7-1
Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT9D33AA	Small System Multi-Drive Unit (SMDU)
1	1	NT9D34AA	Enhanced Multi-Drive System Interface (EMSI)
	1	NT9D47AB	EMSI to SMDU Data Cable, 2 ft (610mm)
1		or	
	1	NT9D47AD	EMSI to SMDU Data Cable, 6 ft (1830mm)
1	1	NT9D66AB	EMSI to SMDU Power Cable, 2 ft (610mm)
		or	
1	1	NT9D66AD	EMSI to SMDU Power Cable, 6 ft (1830mm)
1	1	NTND01CA	12MB CPU/Memory Card
1	1	NTND02BA Rls 2	Misc, Dual SDI Peripheral Signaling Pack with Battery (MSPS)
1	1	NTND31AA Rls 3	Daughter board (ROM)

Note: The vintages shown on circuit cards in Table 7-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

Summary of steps to upgrade

Upgrading consists of:

- removal of CPU/MEM, PS, FDI and FDU
- installation of Option 21E cards and cables
- sysload

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

Removal of CPU/MEM, PS, FDI and FDU

To remove cards:

- 1 Remove software disks from the Floppy Disk Unit.
- 2 Disconnect the cable from the faceplate of the FDI and FDU.
- 3 Set the ENB/DIS switches on cards located in slots 1, 2, 3 and 4 to DIS.
- 4 Remove the Floppy Disk Unit and cards located in slots 1, 2, 3 and 4.

Installation of Option 21E equipment

To install Option 21E cards and cables:

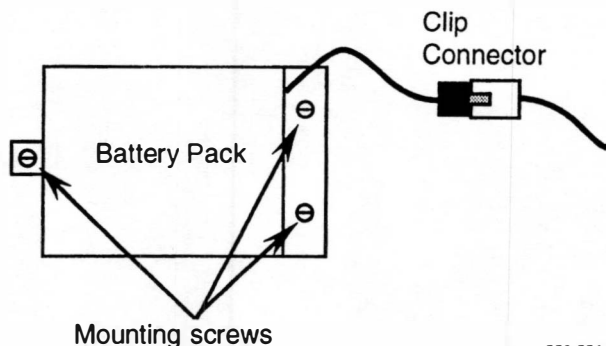
- 1 Set the ENB/DIS switch on the NT9D34 EMSI card to DIS.
- 2 Mount the appropriate software cartridge on the EMSI card and set option switches 1, 5, 7 and 8 to ON.
- 3 Install EMSI card in card slot 3 and set the ENB/DIS switch to ENB.
- 4 Install the NTND31AA ROM card onto the NTND01CA CPU/Memory card:
 - Carefully plug the ROM card into the pin connector.
 - Install the screw and washer at each corner of the ROM card.
- 5 Install the CPU/Memory card in card slot 2.
- 6 Set the ENB/DIS switch on the MSPS card to DIS.
- 7 Set option switches on the MSPS card to activate SDI ports. To avoid conflicting addresses, determine the appropriate option switch settings, refer to *Circuit card installation and testing* (553-3001-211).

- 8 Connect the battery pack on the NTND02BA MSPS card by plugging the battery clip connector to the clip connector on the board as illustrated in Figure 7-1.

Note: The battery will not be fully charged until 24 hours after installation in a powered system.

Figure 7-1

Battery pack connection to the MSPS



- 9 Install the NTND02BA MSPS card in slot 4.
- 10 Connect the NTND37 Dual SDI cable to the connector on the NTND02BA MSPS faceplate.
- 11 Set the ENB/DIS switch on the NTND02BA MSPS card to ENB.
- 12 Install the NT9D33 SMDU in its assigned position in the CE shelf. The SMDU may be installed in an alternate location such as the old network shelf in position 6 or any available PE slots, provided the NT9D47 and NT9D66 interface cables will reach from the SMDU to the EMSI.

Sysload

Before you sysload the system, review installation steps and verify that all circuit cards are in the appropriate card slots, ENB/DIS switches are set to ENB, and all cables are properly connected.

7-6 SL-1 QCA109 cabinet upgrade to Meridian 1 Option 21E

- 1 To sysload the system insert the floppy disks into disk drives and press Rld on the CPU/MEM card.
- 2 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Modular upgrade of SL-1 QCA109 cabinet (MS, ST or 21) to Meridian 1 Option 21E

Equipment required

Table 7-2 lists minimum hardware requirements needed to modular upgrade a QCA109 cabinet to a Meridian 1 Option 21E.

Table 7-2
Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT6D43AA or NT7D04AA Rls 3	CE/PE power supply DC
		NT7D00AA	Top cap AC
1	1	NT7D00BA Rls 2	Top cap DC
	1	NT7D09CA	Pedestal DC
1		NT7D14AA or NT8D29AA Rls 4	CE/PE power supply AC
		NT8D11AB Rls 2	CE/PE module AC
1	1	NT8D11DC	CE/PE module DC
		NT8D27AB Rls 3	Pedestal AC
1	1	NT8D22AC	System monitor
1		NT8D52AA	Pedestal blower unit AC
1	1	NT8D52DC	Pedestal blower unit DC (DC system)
		NT8D53AB Rls 5	Power distribution AC
-continued-			

Table 7-2 (continued)

Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT8D17AA Rls 9	Conference/TDS circuit card
1	1	NT8D18AA Rls 9	Digitone Receiver Network card
1	1	NT8D41AA Rls 2	2 Port SDI Paddle Board
1	1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	1	NT8D46AL	System monitor serial link cable
1	1	NT8D46BH	System monitor to SDI cable
1	1	NT8D82	MSPS to I/O cable
3	3	NT8D84AA	SDI Paddle Board to I/O Cable
1	1	NT8D95AJ	SDI I/O panel to DTE/DCE, 16 ft (4875 mm)
1	1	NT9D33AA	Small System Multi-Drive Unit (SMDU)
1	1	NT9D34AA	Enhanced Multi-Drive System Interface (EMSI)
1	1	NT9D47AB	EMSI to SMDU Data Cable, 2 ft (610mm)
	1	or NT9D47AD	EMSI to SMDU Data Cable, 6 ft (1830mm)
1	1	NT9D66AB	EMSI to SMDU Power Cable, 2 ft (610mm)
	1	or NT9D66AD	EMSI to SMDU Power Cable, 6 ft (1830mm)
1	1	NTND01CA	12MB CPU/Memory Card
1	1	NTND02BA Rls 2	Misc, Dual SDI Peripheral Signaling Pack with Battery (MSPS)
1	1	NTND31AA Rls 3	ROM daughter board
1	1	NTND37AA	MSPS I/O to DTE/DCE cable 8 ft (2440 mm)
1	1	QPC84Q	Power Monitor

Note: The vintages shown on circuit cards in Table 7-2 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA109 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 21E Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 21E to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 21E to the existing cabinet.
- A second NT8D86 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Note: The second NT8D86 cable is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as a QCA7 or 8) do not require the second NT8D86 cable since the NT8D73 cable can be connected directly to the Peripheral Buffer connector. For existing cabinets equipped to suppress EMI, refer to 553-3001-150, *Upgrade Engineering*.

Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

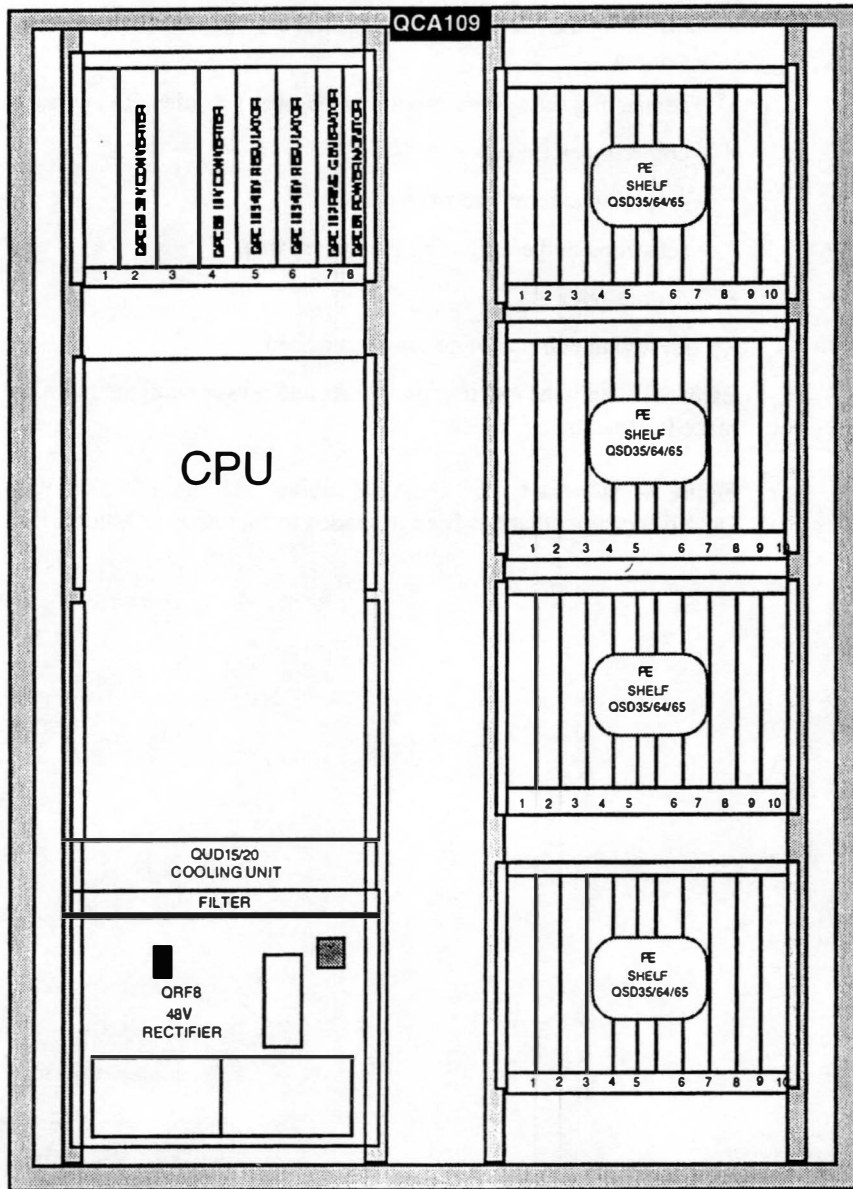
Upgrading consists of:

- installing the Meridian 1 Option 21E system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 7-2 shows a typical QCA109 cabinet and Figure 7-3 shows a QCA109 cabinet that has been upgraded to Meridian 1 Option 21E.

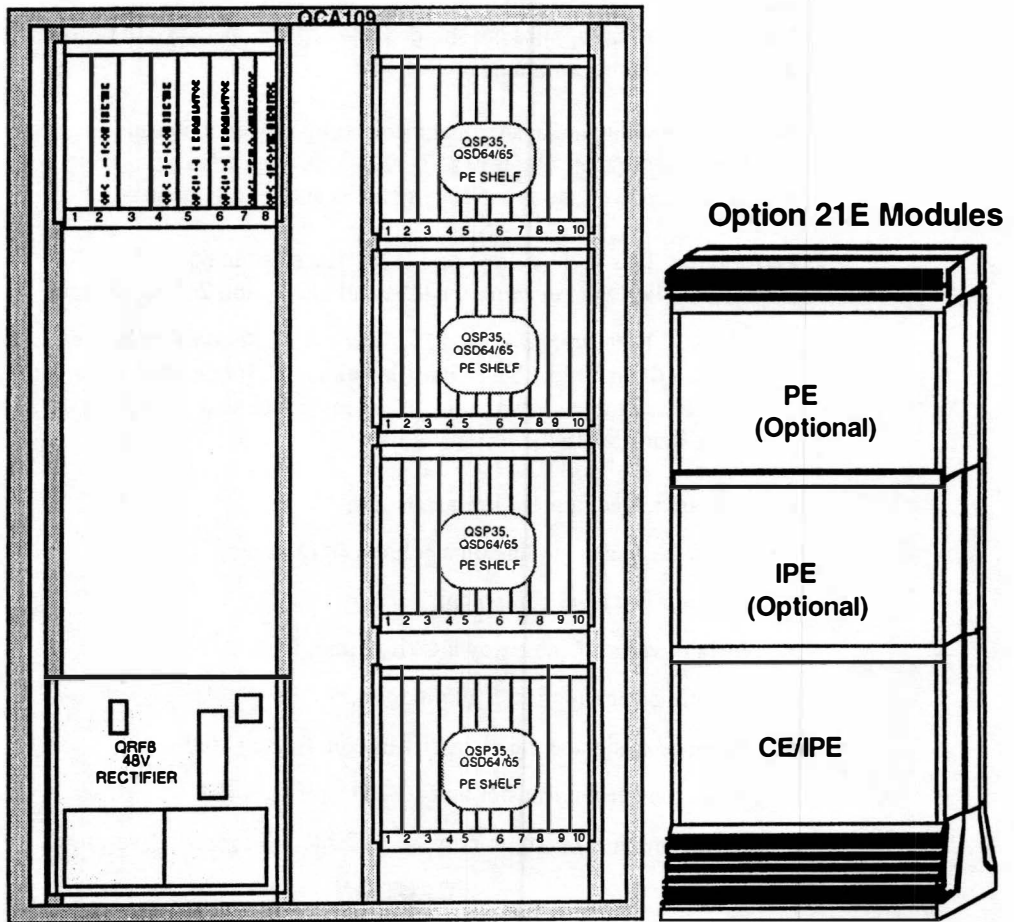
Figure 7-2
Typical QCA109 cabinet



553-5715

Figure 7-3

Typical QCA109 cabinet that has been upgraded to Meridian 1 Option 21E



Installing the Meridian 1 Option 21E system

The Option 21E equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, CPU/Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 21E equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 7-3 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.

- Install cabling:
 - Cable common equipment
 - Cable network loops (within the Option 21E columns only).
- Note:* Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.
- Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 21E equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 7-4 shows Option 21E circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 7-3**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 7-3 (continued)**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 7-3 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves				Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."					
For each slave, indicates the slave address				Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."					
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master		on						
	slave		off						
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

Table 7-3 (continued)

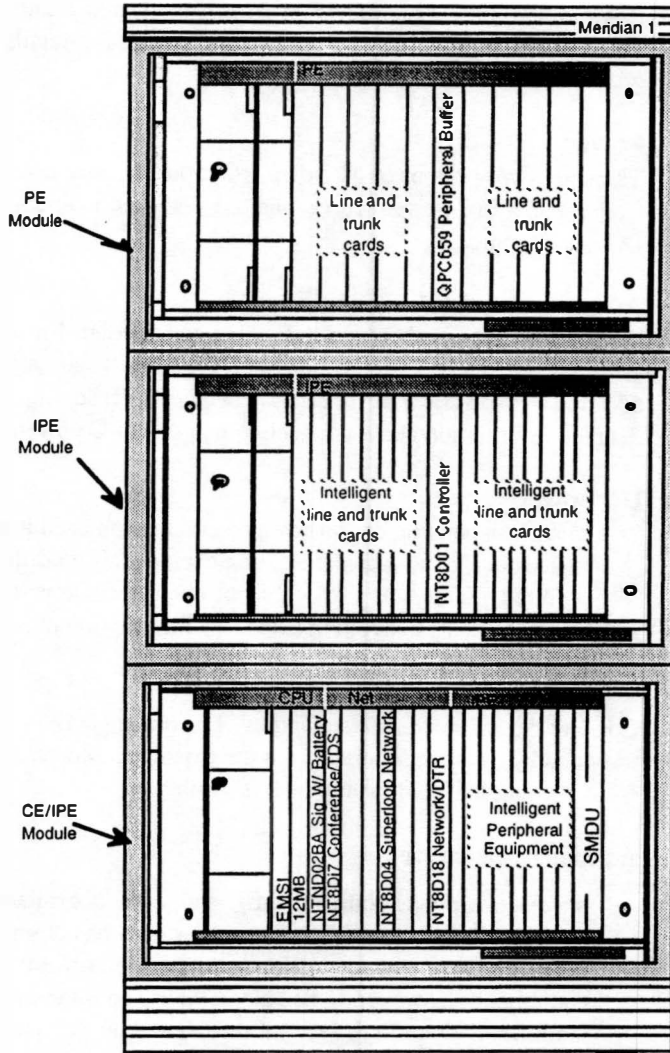
NT8D22 system monitor — settings for total number of slaves — SW2 on master

How many slave units		Switch position						How many slave units		Switch position					
		3	4	5	6	7	8			3	4	5	6	7	8
0		on	on	on	on	on	on	32		off	on	on	on	on	on
1		on	on	on	on	on	off	33		off	on	on	on	on	off
2		on	on	on	on	off	on	34		off	on	on	on	off	on
3		on	on	on	on	off	off	35		off	on	on	on	off	off
4		on	on	on	off	on	on	36		off	on	on	off	on	on
5		on	on	on	off	on	off	37		off	on	on	off	on	off
6		on	on	on	off	off	on	38		off	on	on	off	off	on
7		on	on	on	off	off	off	39		off	on	on	off	off	off
8		on	on	off	on	on	on	40		off	on	off	on	on	on
9		on	on	off	on	on	off	41		off	on	off	on	on	off
10		on	on	off	on	off	on	42		off	on	off	on	off	on
11		on	on	off	on	off	off	43		off	on	off	on	off	off
12		on	on	off	off	on	on	44		off	on	off	off	on	on
13		on	on	off	off	on	off	45		off	on	off	off	on	off
14		on	on	off	off	off	on	46		off	on	off	off	off	on
15		on	on	off	off	off	off	47		off	on	off	off	off	off
16		on	off	on	on	on	on	48		off	off	on	on	on	on
17		on	off	on	on	on	off	49		off	off	on	on	on	off
18		on	off	on	on	off	on	50		off	off	on	on	off	on
19		on	off	on	on	off	off	51		off	off	on	on	off	off
20		on	off	on	off	on	on	52		off	off	on	off	on	on
21		on	off	on	off	on	off	53		off	off	on	off	on	off
22		on	off	on	off	off	on	54		off	off	on	off	off	on
23		on	off	on	off	off	off	55		off	off	on	off	off	off
24		on	off	off	on	on	on	56		off	off	off	on	on	on
25		on	off	off	on	on	off	57		off	off	off	on	on	off
26		on	off	off	on	off	on	58		off	off	off	on	off	on
27		on	off	off	on	off	off	59		off	off	off	on	off	off
28		on	off	off	off	on	on	60		off	off	off	off	on	on
29		on	off	off	off	on	off	61		off	off	off	off	on	off
30		on	off	off	off	off	on	62		off	off	off	off	off	on
31		on	off	off	off	off	off	63		off	off	off	off	off	off
— continued —															

Table 7-3 (continued)
NT8D22 system monitor — slave address — SW2 on slave

Slave unit address							Position							Slave unit address							Position										
345678							345678							345678							345678										
1	on	on	on	on	on	off	33	off	on	on	on	on	on	off	34	off	on	on	on	on	off	on	on	off	35	off	on	on	on	off	off
2	on	on	on	on	on	off	34	off	on	on	on	on	on	off	35	off	on	on	on	on	off	on	on	off	36	off	on	on	off	on	on
3	on	on	on	on	on	off	35	off	on	on	on	on	on	off	36	off	on	on	on	on	off	on	on	off	37	off	on	on	off	on	off
4	on	on	on	off	on	on	36	off	on	on	on	off	on	on	37	off	on	on	on	off	on	on	off	38	off	on	on	off	off	on	
5	on	on	on	off	on	off	37	off	on	on	on	off	on	off	38	off	on	on	off	off	off	on	off	39	off	on	on	off	off	off	
6	on	on	on	off	off	on	38	off	on	on	off	off	on	on	39	off	on	on	off	off	off	on	off	40	off	on	off	on	on	on	
7	on	on	on	off	off	off	39	off	on	on	off	off	on	on	40	off	on	off	on	on	on	on	off	41	off	on	off	on	on	off	
8	on	on	off	on	on	on	40	off	on	off	on	on	on	on	41	off	on	off	on	on	on	off	42	off	on	off	on	on	off	on	
9	on	on	off	on	on	off	41	off	on	off	on	on	on	off	42	off	on	off	on	on	on	off	43	off	on	off	on	off	off	off	
10	on	on	off	on	off	on	42	off	on	off	on	off	on	off	43	off	on	off	on	off	off	on	off	44	off	on	off	off	on	on	
11	on	on	off	on	off	off	43	off	on	off	on	off	on	off	44	off	on	off	off	off	on	on	off	45	off	on	off	off	on	off	
12	on	on	off	off	on	on	44	off	on	off	off	off	on	on	45	off	on	off	off	off	on	off	46	off	on	off	off	off	on	on	
13	on	on	off	off	on	off	45	off	on	off	off	off	on	off	46	off	on	off	off	off	off	on	off	47	off	on	off	off	off	on	
14	on	on	off	off	off	on	46	off	on	off	off	off	on	off	47	off	on	off	off	off	off	on	off	48	off	on	off	off	off	on	
15	on	on	off	off	off	off	47	off	on	off	off	off	on	off	48	off	on	off	off	off	off	on	off	49	off	on	off	off	off	on	
16	on	off	on	on	on	on	48	off	off	on	on	on	on	on	49	off	off	on	on	on	on	off	50	off	off	on	on	off	on	on	
17	on	off	on	on	on	off	49	off	off	on	on	on	off	on	50	off	off	on	on	on	off	on	off	51	off	off	on	on	off	off	
18	on	off	on	on	off	on	50	off	off	on	on	on	off	on	51	off	off	on	on	on	off	off	off	52	off	off	on	off	on	on	
19	on	off	on	on	off	off	51	off	off	on	on	on	off	off	52	off	off	on	on	on	off	off	off	53	off	off	on	off	on	off	
20	on	off	on	off	on	on	52	off	off	on	off	on	on	off	53	off	off	on	off	on	on	off	off	54	off	off	on	off	off	on	
21	on	off	on	off	on	off	53	off	off	on	off	on	off	on	54	off	off	on	off	off	on	off	off	55	off	off	on	off	off	off	
22	on	off	on	off	off	on	54	off	off	on	off	off	on	off	55	off	off	on	off	off	off	on	off	56	off	off	off	on	on	on	
23	on	off	on	off	off	off	55	off	off	on	off	off	on	off	56	off	off	off	on	on	on	on	off	57	off	off	off	on	on	off	
24	on	off	off	on	on	on	56	off	off	off	on	on	on	on	57	off	off	off	on	on	on	off	58	off	off	off	on	off	on	on	
25	on	off	off	on	on	off	57	off	off	off	on	on	off	on	58	off	off	off	on	off	on	off	59	off	off	off	on	off	off	off	
26	on	off	off	on	off	on	58	off	off	off	on	off	on	off	59	off	off	off	on	on	off	off	60	off	off	off	off	on	on	on	
27	on	off	off	on	off	off	59	off	off	off	on	off	off	on	60	off	off	off	off	on	on	off	61	off	off	off	off	on	off	off	
28	on	off	off	off	on	on	60	off	off	off	off	on	on	on	61	off	off	off	off	on	on	off	62	off	off	off	off	off	on	on	
29	on	off	off	off	on	off	61	off	off	off	off	on	off	on	62	off	off	off	off	on	off	off	63	off	off	off	off	off	off	off	
30	on	off	off	off	off	on	62	off	off	off	off	off	on	on	63	off	off	off	off	off	off	off									
31	on	off	off	off	off	off	63	off	off	off	off	off	off	off																	
32	off	on	on	on	on	on																									

Figure 7-4
Meridian 1 Option 21E CPU/IPE module with IPE and PE modules



Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 21E: one designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 21E, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Note: Depending on the power configuration used it may be required to do modifications to the existing cabinets. If modifications are required, do them as part of the cut-over procedures (described later in this document) to avoid unnecessary interruption of service to the end users.

Connect the DC power to the Option 21E columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 21E equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 21E module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 21E modules.

- a new power source installed in conjunction with the Option 21E.

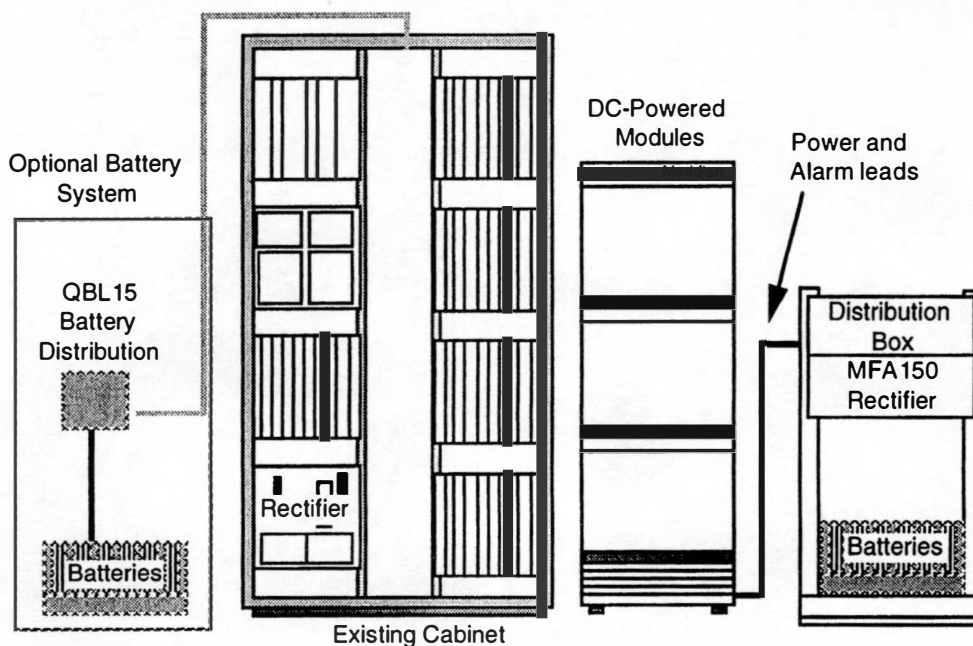
To determine the power requirements for the Option 21E system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 7-5 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 21E modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 21E column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 7-5

Typical arrangement of independently DC-powered Meridian 1 Option 21E modules



Note: An MFA150 cannot share a battery string connected to QBL15, QBL12 or QCA13. A separate battery string is required for the MFA150.

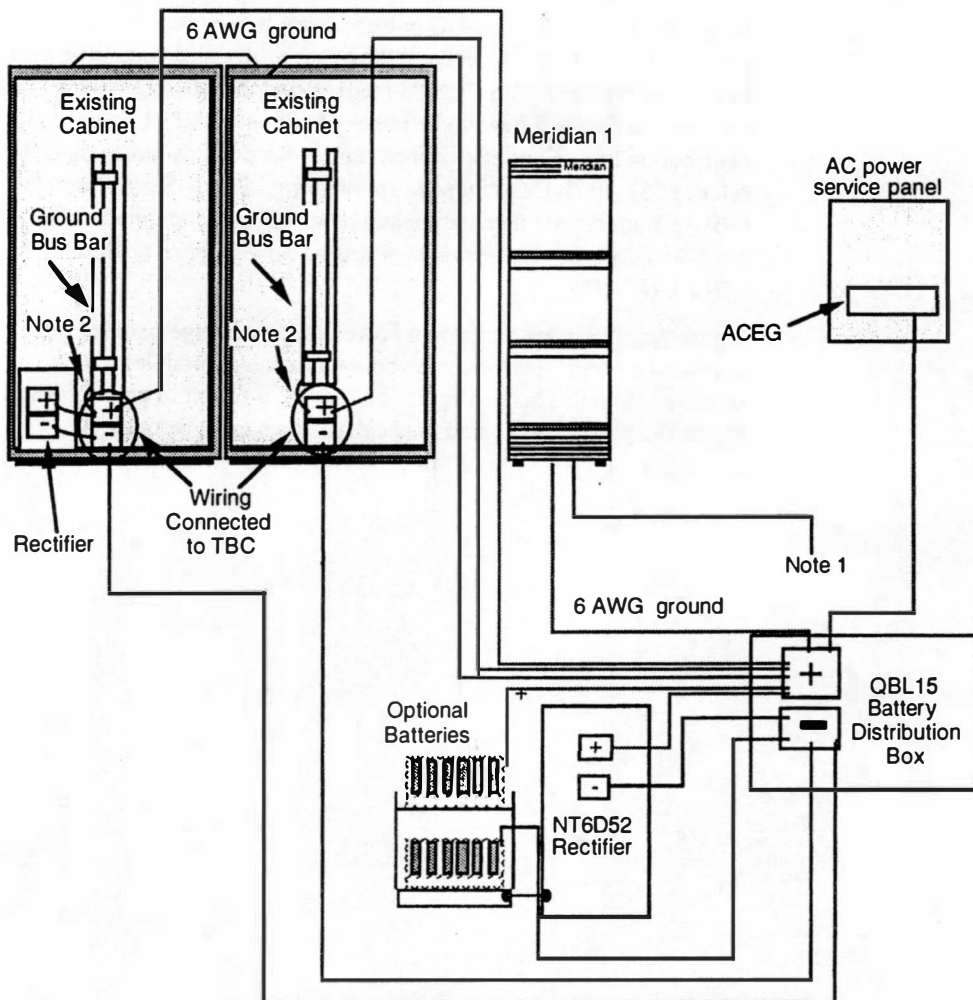
Common power source

Existing cabinet rectifier as a common power source

- When the existing cabinet DC power source is used as a common power source for the cabinet and the column, any QSD4 rectifier will have to be replaced with a QRF8 rectifier and the existing battery distribution box will have to be replaced with a QBL15 battery distribution box. For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 7-6 illustrates a common power supply arrangement for the upgraded system. This includes both Option 21E modules and the existing cabinet. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

Figure 7-6

Typical arrangement using a common DC power supply with optional battery backup



Note 1: DC power feeds from the QBL15 to the Meridian 1. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

Note 2: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

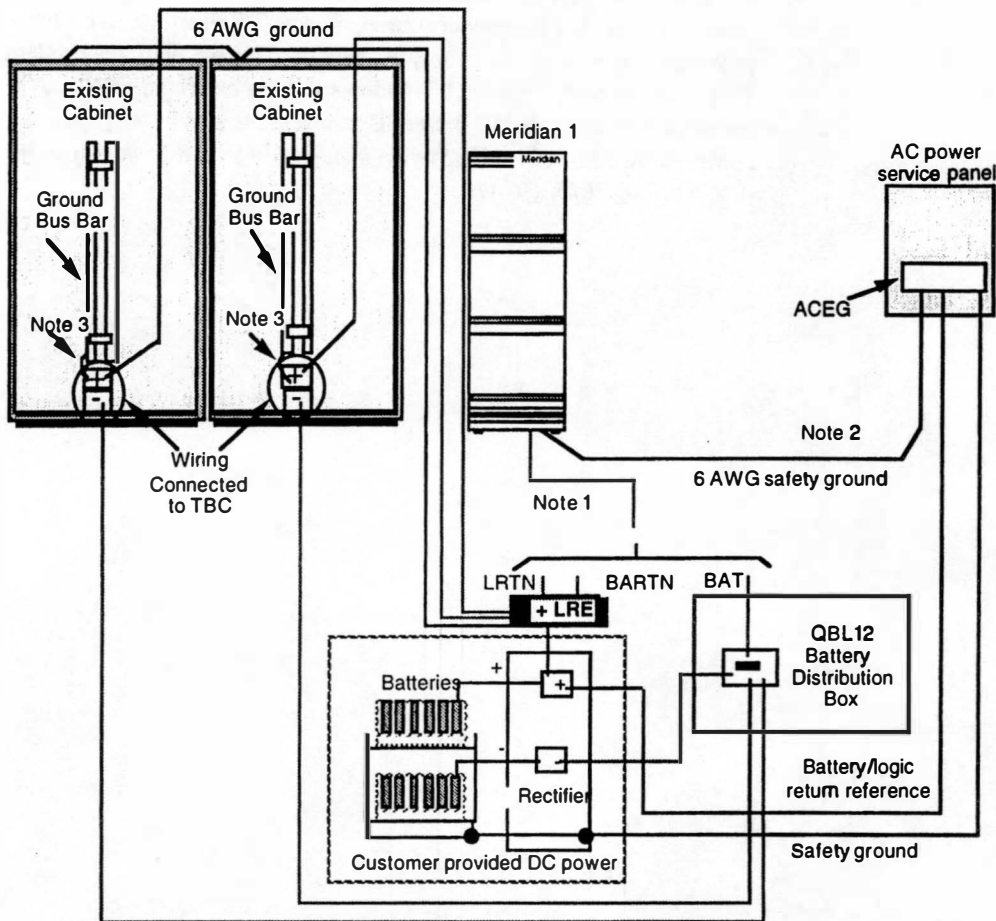
At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

Customer provided power as a common power source

- A QBL12 Battery Distribution Box is normally used to connect to a customer provided DC power source. Figure 7-7 illustrates a customer provided common power supply arrangement for the upgraded system. This includes both Option 21E modules and the existing cabinet. A full description of QBL12 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 7-7

Typical arrangement using a customer provided common DC power supply



Note 1: DC powerfeeds. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

Note 2: With customer provided power equipment, the Meridian 1 frame requires a direct connection to the ACEG. In addition, the positive bus bar in the customer provided equipment must connect to the ACEG.

Note 3: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

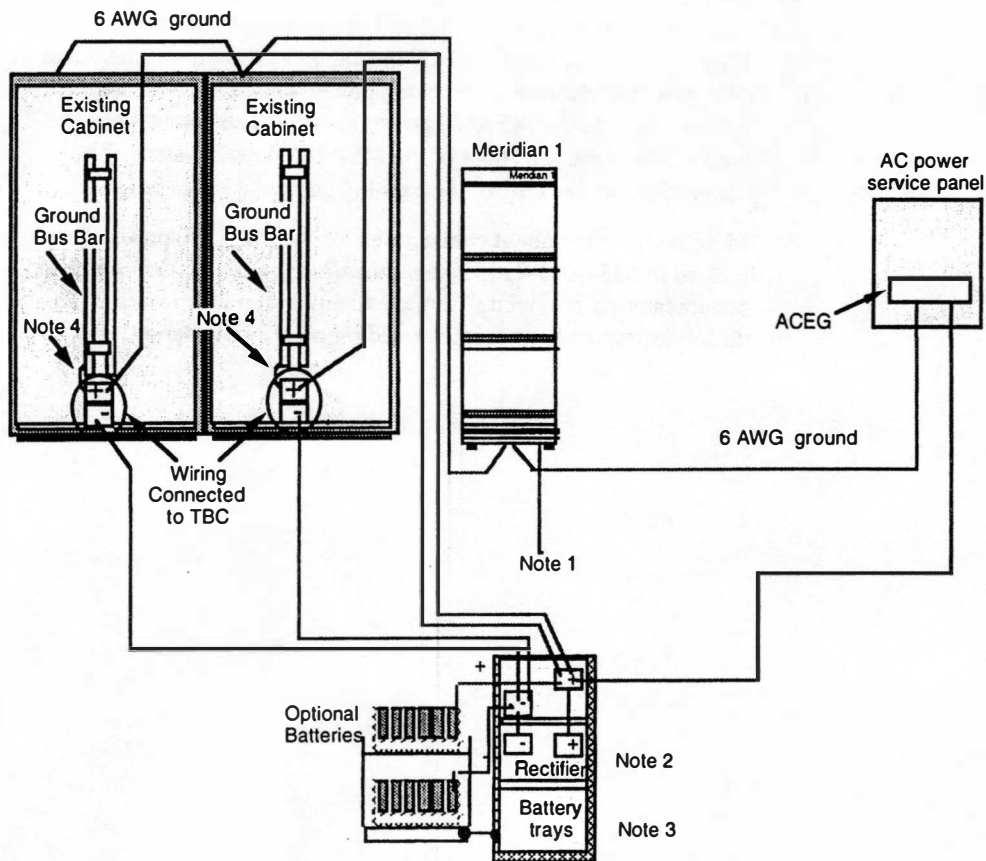
At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

An MFA150 power system as a common power source

- An MFA150 power system assembly can be used as a common power source for both the Option 21E and the existing cabinets as shown in Figure 7-8. To connect the existing cabinets, disconnect the + and - 48V power leads from the existing power source, then reroute and connect them to the MFA150 power system. The connections are located under the top cover of the MFA150 power system. The connections at the TBC of the existing cabinet do not change.
- More information about connections for the MFA150 power system is located in 553-3001-210, *System installation procedures*. Refer to the documentation provided with the existing system for information about disconnecting and removing the old rectifier and batteries.

Figure 7-8

Typical arrangement using an MFA150 power system as a common power source



Note 1: DC power feeds from the MFA150 to the Meridian 1. Each feed consists of two BAT(-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

Note 2: The MFA150 power system may be equipped with one or two power shelves for a maximum of 75 amps or 150 amps respectively.

Note 3: Batteries may be installed in two optional battery trays located under the rectifier shelves.

Note 4: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

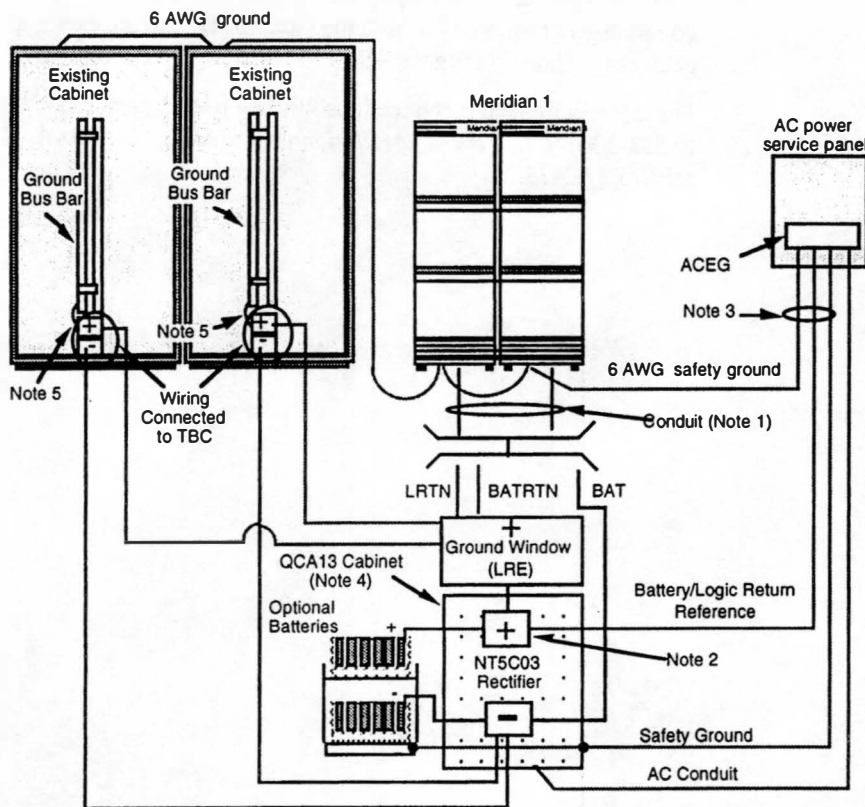
At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

An existing QCA13 power cabinet as a common power source

- A QCA13 power cabinet equipped with rectifiers can be used as a common power source for both the Option 21E and the existing cabinets as shown in Figure 7-9.
- For information about connections for the QCA13 power cabinet, refer to 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 7-9

Typical arrangement using a QCA13 as a common power source



Note 1: DC power feeds to Meridian 1 pedestals. Each feed consists of two BAT (-), two BATRTN (+), and one LRTN (+) conductors. If required, conductors can be run in conduit as shown. BAT (-) connects to the appropriate fuse in the rectifier cabinet.

Note 2: The QCA13 cabinet does not contain a bus for terminating individual battery and logic returns. A ground window should be used to consolidate all battery and logic returns.

Note 3: The Battery/Logic Return Reference wiring and the safety ground wiring must be #6 AWG, minimum.

Note 4: Up to four NT5C03 rectifiers can be equipped in a QCA13 cabinet for a total of 200 amps.

Note 5: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 21E modules.

These cables connect the System Monitor to the SDI Paddle Board in the CPU/Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section '**Separate power source**' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 7-10) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the new system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 21E system:

- 1 Power up and initially load the Option 21E column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.

- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
- 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
- 4 The Meridian 1 Option 21E system is now operational.

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 21E column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 Connect an NT8D86 cable between the connector on the faceplate of the network card and the I/O panel of the Option 21E. One cable is required for each network loop.
- 2 Connect an NT8D73 shielded cable, up to 30 ft (9 m) in length, to the connector on the I/O panel of the Option 21E. Route the NT8D73 cable to the existing cabinet. Do not connect it to the Peripheral Buffer card in the existing cabinet at this time.

Note: Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

- 3 If required in the existing cabinet (see Note) connect an NT8D86 cable to the connector on the NT8D73 shielded cable from the Option 21E. Make sure that the connectors are locked together with the locking devices. Do not connect the cable to the faceplate of the Peripheral Buffer card at this time. It will be connected as part of the cutover procedure.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable.

Cutting-over

The following procedure describes how to cut-over to the Option 21E system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL12 or QCA13 unit**
Remove the fuses from the -48V fuse panel corresponding to each cabinet and column.
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.

Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.

 - **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
 - **AC powered modules**
Set the AC power supply breaker at the AC power service panel to OFF.
- 2 If required, perform power modifications to the existing cabinets as described in step 3.
- 3 In the existing cabinets, remove the wiring connecting the frame of the cabinet to the positive (+) connection of the TBC, and the wiring connecting the frame to the cabinet ground bus bar. Refer to Figures 7-6 through 7-9.

Note: This wiring was factory installed. It must be removed to avoid ground loops when existing cabinets are used with Meridian 1 modules.

- 4 This step applies only to Meridian 1 modules connected to a DC power source.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 7-10) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

- 5 This step applies only if a new common power source with battery backup connected to a QBL12, QBL15 or QCA13 battery distribution box is to be used.

Note: This step does not apply if the common power source uses an MFA150 power system.

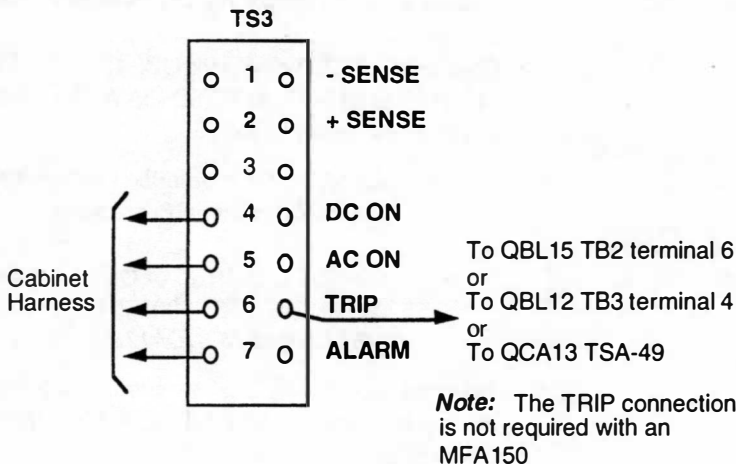
A TRIP lead must be connected to the TRIP connection on:

- the TRIP terminal on the terminal strip on the rectifier in existing cabinets equipped with a rectifier.
- the TRIP terminal of TS3 in existing cabinets not equipped with a rectifier.

The TRIP leads must be connected as follows.

If the existing rectifier is being removed from the cabinet, make the following wiring changes.

- a) If not already connected to TS3, tag and move the cabinet harness DC ON, AC ON, TRIP and ALARM leads presently connected on the rectifier to TS3 as shown in the above drawing. Depending on the type of existing cabinet, the TS3 is located either on the cabinet's TBC block, or on the QUT3 power unit.



- b) Install and connect a 16 AWG wire from terminal 6 (TRIP) on TS3 to the TRIP connection in the QBL12, QBL15 or QCA13 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connections in each cabinet with 16 AWG wire.
- c) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.

Note: The DC ON, AC ON and ALARM lead functions are performed by the Meridian 1 module. Leaving these leads connected in the existing cabinets only extends the alarm indicators to the QPC84 power monitors. If you wish, you may leave these leads disconnected. However, the TRIP lead must be connected.

If the existing rectifier is to remain in the cabinet, make the following wiring changes.

- a) Install and connect a 16 AWG wire from the TRIP connection on the terminal strip of the rectifier to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connection on the terminal strip of the rectifier in each cabinet with 16 AWG wire. In existing cabinets not equipped with a rectifier (such as a QCA7 cabinet powered by a QCA8 cabinet), 'daisy chain' to the TRIP connection on TS3.
 - b) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.
- 6 Remove the QPC84 Power Monitor from the QCA109 cabinet and set switch C11, position 2 to ON. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required. Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.
- Note:* Disregard any remaining alarm indications. Alarm indications should return to normal once the upgrade is completed and equipment that is no longer required has been removed as described later in this chapter.
- 7 Cross-connect the alarm cables as shown in Figure 7-11.
- 8 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.

- 9 Connect the NT8D86 cables (if provided) or NT8D73 shielded network cables from the Option 21E to the connector on the faceplate of the Peripheral Buffer circuit card in the existing cabinets.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable. The NT8D73 shielded cable can be connected directly to the connector of the Peripheral Buffer card.

—OR—

If the existing cabinet is equipped to suppress EMI, the NT8D73 shielded cable should be connected to its assigned filter connector. See 553-3001-150, *Upgrade Engineering*.

- 10 Restore power to the cabinets and column by reinserting the removed fuse and resetting all circuit breakers to ON.

CAUTION

Do not remove the NT8D22 system monitor (XSM) from the column while the system is in service. Removing the XSM may cause the input circuit breakers on the existing cabinets to trip.

-
- 11 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Figure 7-10
NT8D46 cable types

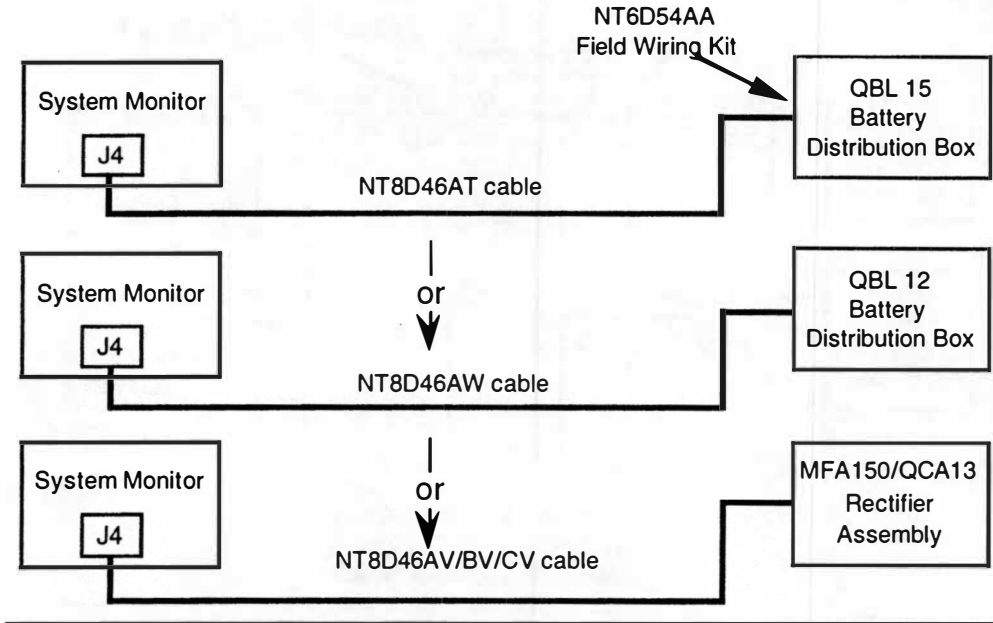
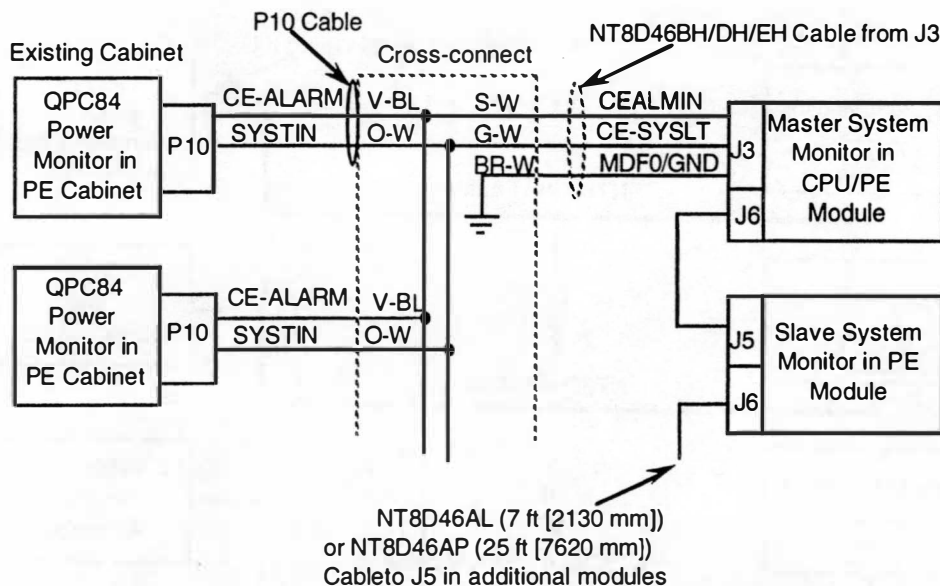


Figure 7-11
Connecting alarm cables between a cabinet and a column



Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

Removing equipment no longer required

The following procedure describes how to remove the equipment that is no longer required once the Option 21E is operating normally.

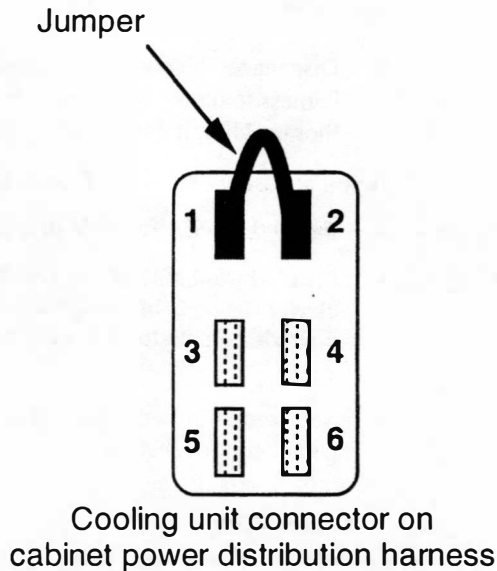
- 1 Set circuit breakers CB7, CB8, CB9 and CB10 on the QSP43 power control shelf in the QCA109 cabinet to OFF.
- 2 Remove the fuse labeled TPUN1 from the QSP43 power control shelf in the QCA109 cabinet.
- 3 Disconnect and remove cables from connectors on the faceplate of the following circuit cards located on the CE shelf:
 - QPC425 CPU/SDI circuit card.
 - QPC376 network circuit cards.
 - QPC139 SDI2 circuit cards, if equipped.
- 4 Remove CE circuit cards from the CE shelf and store them in a safe place.
- 5 Remove the tape unit from the cabinet.

Note: The tape unit must first be removed before the tape unit connector can be disconnected.

- Disconnect the power connector from the cabinet power wiring harness to the shelf housing the tape unit or QMM38 Mass Storage Unit, if equipped.
- 6 If you are using the main CE shelf for DTI/PRI cards:
 - Install the DTI/PRI cards in available CE shelf card slots.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the CPU/Network module of the Option 21E upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breakers CB7, CB8, CB9 and CB01 on the QSP43 power control shelf to ON.

- 7 If you are not going to use the CE shelf for DTI/PRI cards:
- Disconnect harness alarm connector C21 from the CE shelf.
 - Unplug all remaining circuit cards from the CE shelf.
 - Disconnect power connections from the backplane of the CE shelf.
 - Disconnect and remove the QUD15 or QUD20 cooling unit. Place a jumper (a piece of 24 or 26 AWG bare wire or a paper clip can be used) across power monitor leads 1 and 2 of the cooling unit power connector as shown in Figure 7-12. This disables the alarm for the removed cooling unit.
- Note:** If the cabinet is equipped with an expansion CE shelf (a second CE shelf) disconnect and remove the wiring between the +5V, +12V, -12V, and LGND connections on the CE shelf.
- Tape all exposed power leads with electrical insulation tape.

Figure 7-12
Cooling unit alarm connection



SL-1 QCA136/QCA137 cabinet upgrade to Meridian 1 Option 21E

This procedure is used to upgrade an SL-1 QCA136/QCA137 cabinet (ST or 21) to Meridian 1 Option 21E. To upgrade to a Meridian 1 Option 21E system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 21E:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 21E operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 21E is operating with the new software provided with the Option 21E.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 21E operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Hardware upgrade methods

There are two methods of upgrading a QCA136/QCA137 cabinet to a Meridian 1 Option 21E:

- 1 Card level upgrade.
- 2 Modular upgrade.

Card upgrade of SL-1 QCA136 cabinet (ST or 21) to Meridian 1 Option 21E

Equipment required

Table 8-1 lists minimum hardware requirements needed for a card level upgrade of a QCA136 cabinet to a Meridian 1 Option 21E.

Table 8-1
Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT9D33AA	Small System Multi-Drive Unit (SMDU)
1	1	NT9D34AA	Enhanced Multi-Drive System Interface (EMSI)
1	1	NT9D47AB	EMSI to SMDU Data Cable, 2 ft (610mm)
	1	or NT9D47AD	EMSI to SMDU Data Cable, 6 ft (1830mm)
1	1	NT9D66AB	EMSI to SMDU Power Cable, 2 ft (610mm)
1	1	or NT9D66AD	EMSI to SMDU Power Cable, 6 ft (1830mm)
1	1	NTND01CA	12MB CPU/Memory Card
1	1	NTND02BA RIs 2	Misc, Dual SDI Peripheral Signaling Pack with Battery (MSPS)
1	1	NTND31AA RIs 3	Daughter board (ROM)

Note: The vintages shown on circuit cards in Table 8-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

Summary of steps to upgrade

Upgrading consists of:

- removal of CPU/MEM, PS, FDI and FDU
- installation of Option 21E cards and cables
- sysload

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

Removal of CPU/MEM, PS, FDI and FDU

To remove cards:

- 1 Remove software disks from the Floppy Disk Unit.
- 2 Disconnect the cable from the faceplate of the FDI and FDU.
- 3 Set the ENB/DIS switches on cards located in slots 1, 2, 3 and 4 to DIS.
- 4 Remove the Floppy Disk Unit and cards located in slots 1, 2, 3 and 4.

Installation of Option 21E equipment

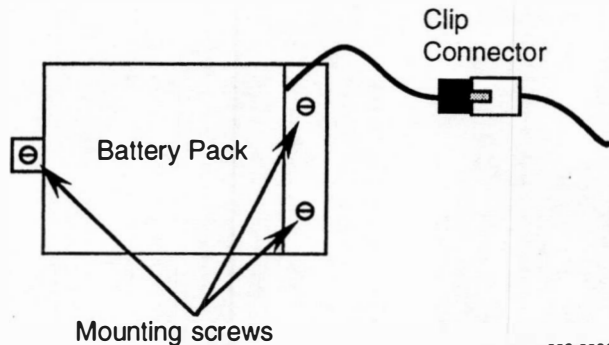
To install Option 21E cards and cables:

- 1 Set the ENB/DIS switch on the NT9D34 EMSI card to DIS.
- 2 Mount the appropriate software cartridge on the EMSI card and set option switches 1, 5, 7 and 8 to ON.
- 3 Install EMSI card in card slot 3 and set the ENB/DIS switch to ENB.
- 4 Install the NTND31AA ROM card onto the NTND01CA CPU/Memory card:
 - Carefully plug the ROM card into the pin connector.
 - Install the screw and washer at each corner of the ROM card.
- 5 Install the CPU/Memory card in card slot 2.
- 6 Set the ENB/DIS switch on the MSPS card to DIS.
- 7 Set option switches on the MSPS card to activate SDI ports. To avoid conflicting addresses, determine the appropriate option switch settings, refer to *Circuit card installation and testing* (553-3001-211).

- 8 Connect the battery pack on the NTND02BA MSPS card by plugging the battery clip connector to the clip connector on the board as illustrated in Figure 8-1.

Note: The battery will not be fully charged until 24 hours after installation in a powered system.

Figure 8-1
Battery pack connection to the MSPS



553-5566

- 9 Install the NTND02BA MSPS card in slot 4.
- 10 Connect the NTND37 Dual SDI cable to the connector on the NTND02BA MSPS faceplate.
- 11 Set the ENB/DIS switch on the NTND02BA MSPS card to ENB.
- 12 Install the NT9D33 SMDU in its assigned position in the CE shelf. The SMDU may be installed in an alternate location such as the old network shelf in position 6 or any available PE slots, provided the NT9D47 and NT9D66 interface cables will reach from the SMDU to the EMSI.

Sysload

Before you sysload the system, review installation steps and verify that all circuit cards are in the appropriate card slots, ENB/DIS switches are set to ENB, and all cables are properly connected.

- 1 To sysload the system insert the floppy disks into disk drives and press Rld on the CPU/MEM card.
- 2 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Module upgrade of an SL-1 QCA136/QCA137 cabinet (ST or 21) to Meridian 1 Option 21E

Equipment required

Table 8-2 lists minimum hardware requirements needed to modular upgrade a QCA136/QCA137 cabinet to a Meridian 1 Option 21E.

Table 8-2
Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT6D43AA or NT7D04AA RIs 3	CE/PE power supply DC
		NT7D00AA	Top cap AC
1	1	NT7D00BA RIs 2	Top cap DC
	1	NT7D09CA	Pedestal DC
1		NT7D14AA or NT8D29AA RIs 4	CE/PE power supply AC
		NT8D11AB RIs 2	CE/PE module AC
1	1	NT8D11DC	CE/PE module DC
		NT8D27AB RIs 3	Pedestal AC
1	1	NT8D22AC	System monitor
1		NT8D52AA	Pedestal blower unit AC
1	1	NT8D52DC	Pedestal blower unit DC (DC system)
		NT8D53AB RIs 5	Power distribution AC
-continued-			

Table 8-2 (continued)
Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT8D17AA Rls 9	Conference/TDS circuit card
1	1	NT8D18AA Rls 9	Digitone Receiver Network card
1	1	NT8D41AA Rls 2	2 Port SDI Paddle Board
1	1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	1	NT8D46AL	System monitor serial link cable
1	1	NT8D46BH	System monitor to SDI cable
1	1	NT8D46AX or NT8D46BC	System Monitor Cable QCA136 cabinet or QCA137 cabinet and CE/PE module (see Figure 8-11 and 8-12) or QCA136 and QCA137 cabinets and CE/PE module (see Figure 8-13)
1	1	NT8D82	MSPS to I/O cable
3	3	NT8D84AA	SDI Paddle Board to I/O Cable
1	1	NT8D95AJ	SDI I/O panel to DTE/DCE, 16 ft (4875 mm)
1	1	NT9D33AA	Small System Multi-Drive Unit (SMDU)
1	1	NT9D34AA	Enhanced Multi-Drive System Interface (EMSI)
1	1	NT9D47AB or NT9D47AD	EMSI to SMDU Data Cable, 2 ft (610mm) EMSI to SMDU Data Cable, 6 ft (1830mm)
1	1	NT9D66AB or NT9D66AD	EMSI to SMDU Power Cable, 2 ft (610mm) EMSI to SMDU Power Cable, 6 ft (1830mm)
1	1	NTND01CA	12MB CPU/Memory Card
1	1	NTND02BA Rls 2	Misc, Dual SDI Peripheral Signaling Pack with Battery (MSPS)
1	1	NTND31AA Rls 3	ROM daughter board

1	1	NTND37AA	MSPS I/O to DTE/DCE cable 8 ft (2440 mm)
1	1	QPC84Q	Power Monitor

Note: The vintages shown on circuit cards in Table 8-2 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA136/QCA137 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 21E Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 21E to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 21E to the existing cabinet.
- An NT9J98 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 21E system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 8-2 shows a typical QCA136/QCA137 cabinet and Figure 8-3 shows a QCA136/QCAS 137 cabinet that has been upgraded to Meridian 1 Option 21E.

Figure 8-2
Typical QCA136 cabinet

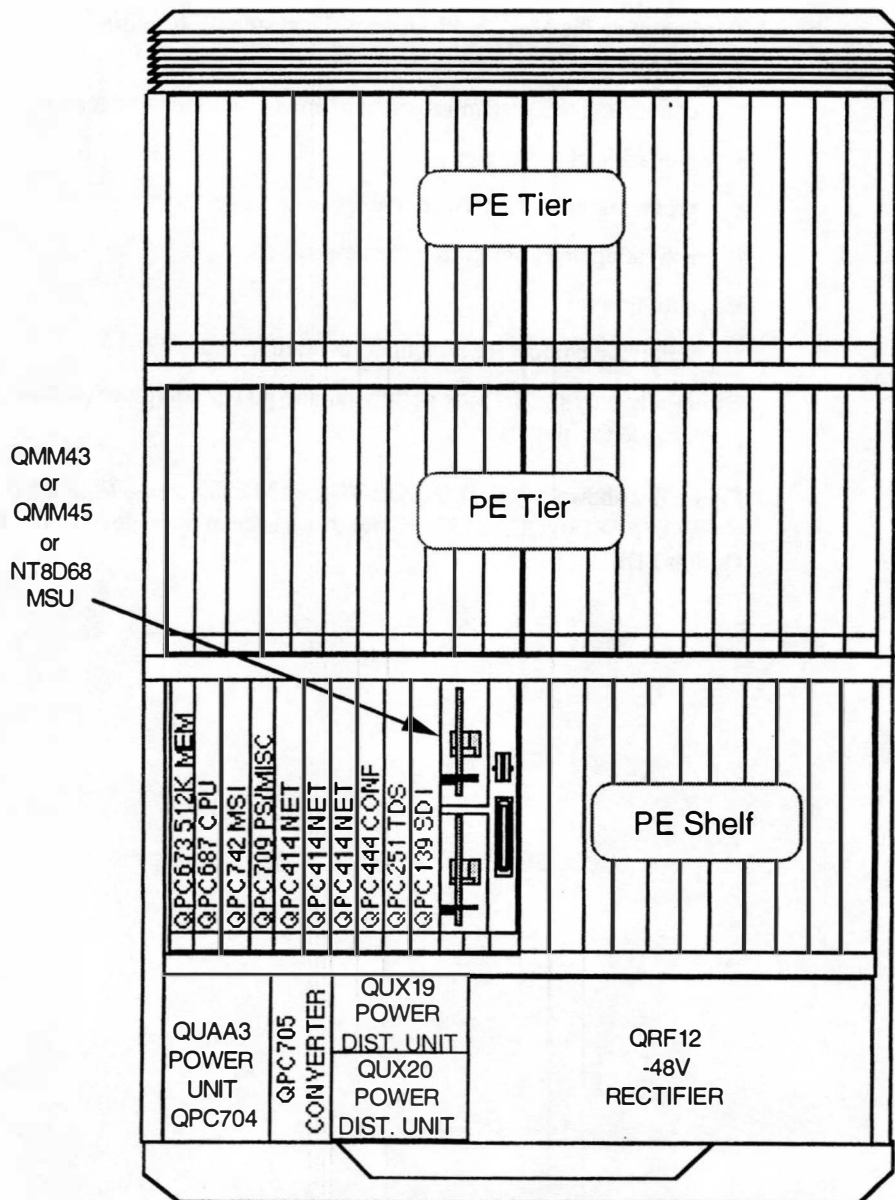
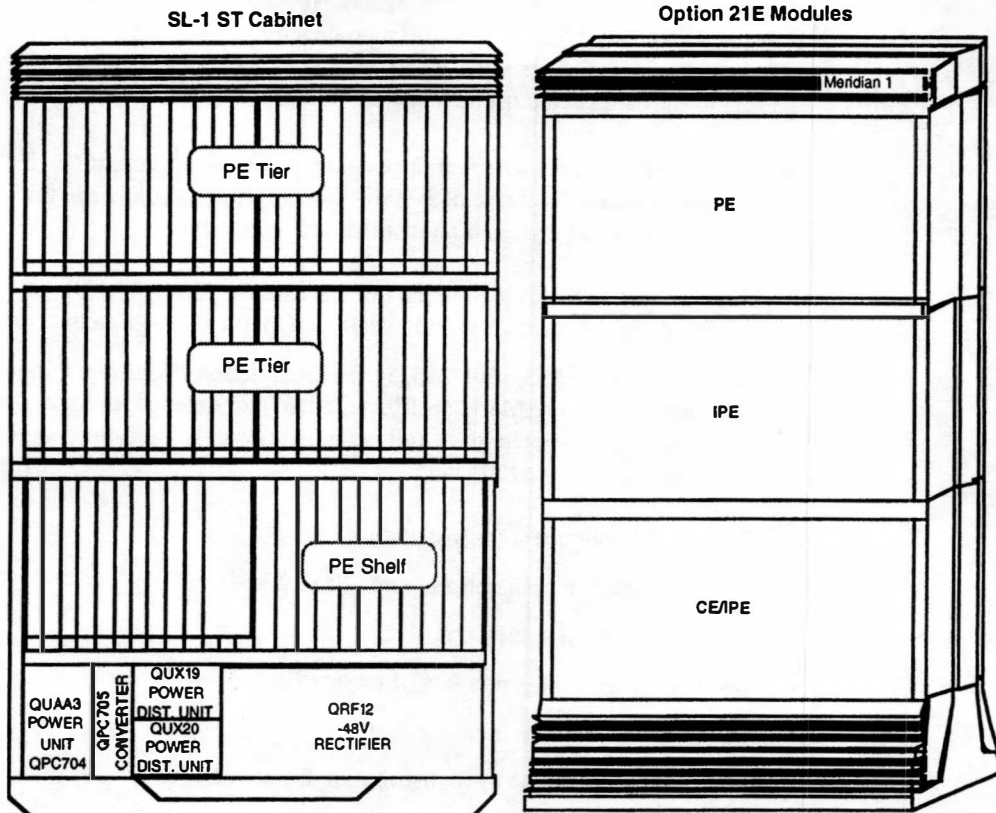


Figure 8-3

Typical QCA136 cabinet that has been upgraded to Meridian 1 Option 21E



Installing the Meridian 1 Option 21E system

The Option 21E equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, CPU/Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 21E equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 8-3 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.
- Install cabling:
 - Cable common equipment

- Cable network loops (within the Option 21E columns only).

Note: Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.

- Cable PE/IPE modules to the MDF and connect lines and trunks.

- Inspect Option 21E equipment in the system.

- All cards must be locked into their assigned slots.

- All connectors must be secured.

- All circuit breakers must be set to OFF.

- All trim panels must be in place.

- All faceplate switches must be set to ENB.

Figure 8-4 shows Option 21E circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 8-3**NT8D22 SW1 system monitor switch settings for upgraded systems**

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
3	ON	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
	OFF	
4	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
5	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
	OFF	
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 8-3 (continued)**NT8D22 SW1 system monitor switch settings for upgraded systems**

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.

NT8D22 SW2

SW2 indication	Position							
	1	2	3	4	5	6	7	8
Master system monitor	on							
Slave system monitor	off							
Operation with ST, STE, or RT		on						
All other operation		off						
For master, indicates total number of slaves					Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."			
For each slave, indicates the slave address					Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."			

NT8D22 SW3

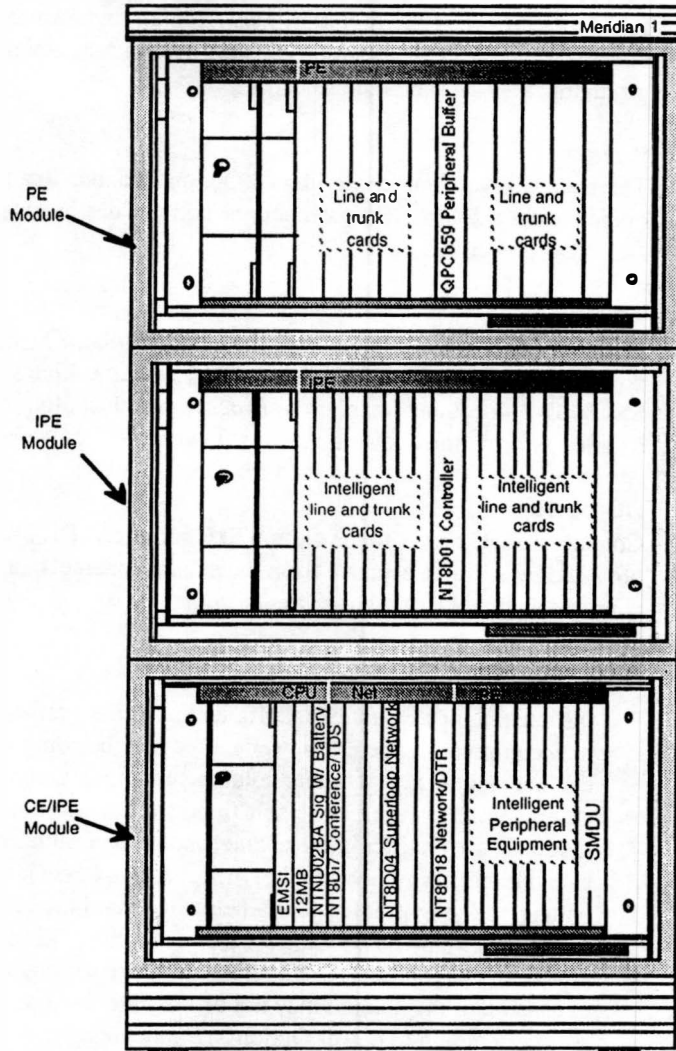
SW3 indication		Position			
		1	2	3	4
CTA	master	on			
	slave	off			
CTR	master		on		
	slave		off		
FAIL	master			on	
	slave			off	
MAJOR	master				on
	slave				off

NT8D22 settings for total number of slaves — SW2 on master

How many slave units		Switch position						How many slave units		Switch position					
		3	4	5	6	7	8			3	4	5	6	7	8
0		on	on	on	on	on	on	32		off	on	on	on	on	on
1		on	on	on	on	on	off	33		off	on	on	on	on	off
2		on	on	on	on	off	on	34		off	on	on	on	off	on
3		on	on	on	on	off	off	35		off	on	on	on	off	off
4		on	on	on	off	on	on	36		off	on	on	off	on	on
5		on	on	on	off	on	off	37		off	on	on	off	on	off
6		on	on	on	off	off	on	38		off	on	on	off	off	on
7		on	on	on	off	off	off	39		off	on	on	off	off	off
8		on	on	off	on	on	on	40		off	on	off	on	on	on
9		on	on	off	on	on	off	41		off	on	off	on	on	off
10		on	on	off	on	off	on	42		off	on	off	on	off	on
11		on	on	off	on	off	off	43		off	on	off	on	off	off
12		on	on	off	off	on	on	44		off	on	off	off	on	on
13		on	on	off	off	on	off	45		off	on	off	off	on	off
14		on	on	off	off	off	on	46		off	on	off	off	off	on
15		on	on	off	off	off	off	47		off	on	off	off	off	off
16		on	off	on	on	on	on	48		off	off	on	on	on	on
17		on	off	on	on	on	off	49		off	off	on	on	on	off
18		on	off	on	on	off	on	50		off	off	on	on	off	on
19		on	off	on	on	off	off	51		off	off	on	on	off	off
20		on	off	on	off	on	on	52		off	off	on	off	on	on
21		on	off	on	off	on	off	53		off	off	on	off	on	off
22		on	off	on	off	off	on	54		off	off	on	off	off	on
23		on	off	on	off	off	off	55		off	off	on	off	off	off
24		on	off	off	on	on	on	56		off	off	off	on	on	on
25		on	off	off	on	on	off	57		off	off	off	on	on	off
26		on	off	off	on	off	on	58		off	off	off	on	off	on
27		on	off	off	on	off	off	59		off	off	off	on	off	off
28		on	off	off	off	on	on	60		off	off	off	off	on	on
29		on	off	off	off	on	off	61		off	off	off	off	on	off
30		on	off	off	off	off	on	62		off	off	off	off	off	on
31		on	off	off	off	off	off	63		off	off	off	off	off	off

NT8D22 slave address — SW2 on slave

Slave unit address							Position							Slave unit address							Position						
	3	4	5	6	7	8									3	4	5	6	7	8							
1	on	on	on	on	on	off								33	off	on	on	on	on	off							
2	on	on	on	on	off	on								34	off	on	on	on	off	on							
3	on	on	on	on	off	off								35	off	on	on	on	off	off							
4	on	on	on	off	on	on								36	off	on	on	off	on	on							
5	on	on	on	off	on	off								37	off	on	on	off	on	off							
6	on	on	on	off	off	on								38	off	on	on	off	off	on							
7	on	on	on	off	off	off								39	off	on	on	off	off	off							
8	on	on	off	on	on	on								40	off	on	off	on	on	on							
9	on	on	off	on	on	off								41	off	on	off	on	on	off							
10	on	on	off	on	off	on								42	off	on	off	on	off	on							
11	on	on	off	on	off	off								43	off	on	off	on	off	off							
12	on	on	off	off	on	on								44	off	on	off	off	on	on							
13	on	on	off	off	on	off								45	off	on	off	off	on	off							
14	on	on	off	off	off	on								46	off	on	off	off	off	on							
15	on	on	off	off	off	off								47	off	on	off	off	off	off							
16	on	off	on	on	on	on								48	off	off	on	on	on	on							
17	on	off	on	on	on	off								49	off	off	on	on	on	off							
18	on	off	on	on	off	on								50	off	off	on	on	off	on							
19	on	off	on	on	off	off								51	off	off	on	on	off	off							
20	on	off	on	off	on	on								52	off	off	on	off	on	on							
21	on	off	on	off	on	off								53	off	off	on	off	on	off							
22	on	off	on	off	off	on								54	off	off	on	off	off	on							
23	on	off	on	off	off	off								55	off	off	on	off	off	off							
24	on	off	off	on	on	on								56	off	off	off	on	on	on							
25	on	off	off	on	on	off								57	off	off	off	on	on	off							
26	on	off	off	on	off	on								58	off	off	off	on	off	on							
27	on	off	off	on	off	off								59	off	off	off	on	off	off							
28	on	off	off	off	on	on								60	off	off	off	off	on	on							
29	on	off	off	off	on	off								61	off	off	off	off	on	off							
30	on	off	off	off	off	on								62	off	off	off	off	off	on							
31	on	off	off	off	off	off								63	off	off	off	off	off	off							
32	off	on	on	on	on	on																					

Figure 8-4**Meridian 1 Option 21E CPU/IPE module with IPE and PE modules**

Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 21E: one that is designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 21E, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Connect the DC power to the Option 21E columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

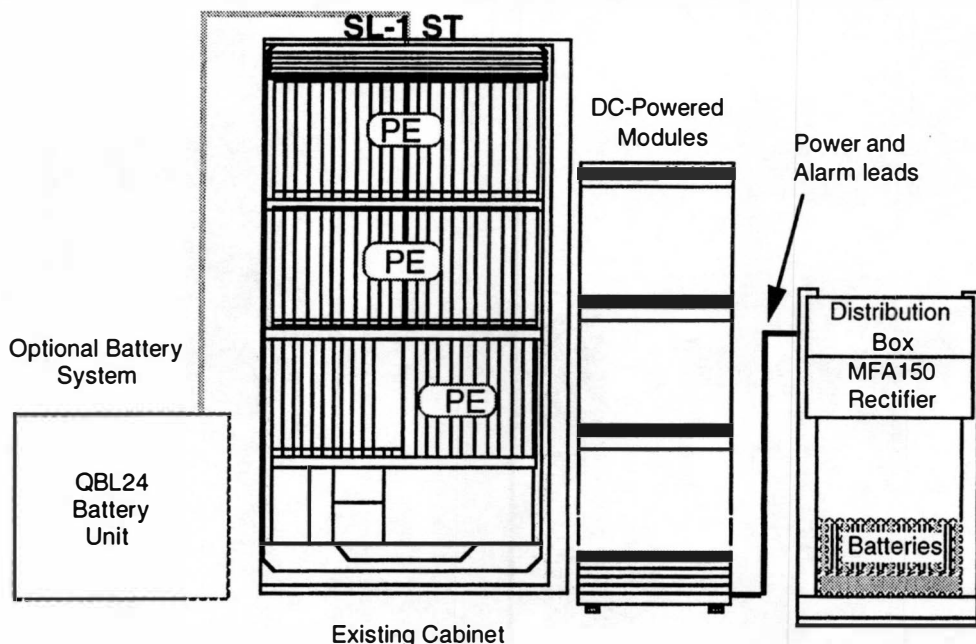
A common source can be:

- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 21E equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 21E module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 21E modules.
- a new power source installed in conjunction with the Option 21E.

To determine the power requirements for the Option 21E system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 8-5 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 21E modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 21E column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

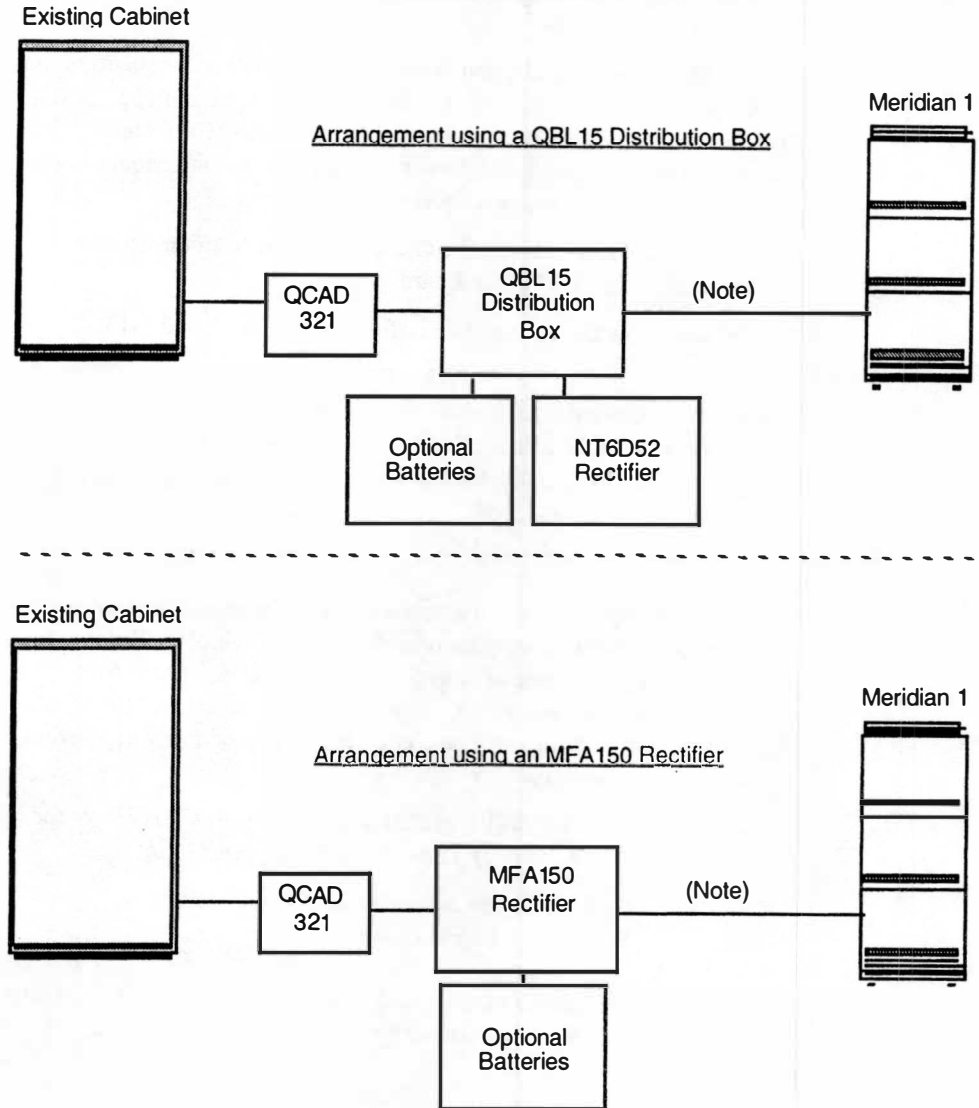
Figure 8-5**Typical arrangement of independently DC-powered Meridian 1 Option 21E modules**

Note: An MFA150 cannot share a battery string connected to QBL15, QBL12 or QCA13. A separate battery string is required for the MFA150.

Common power source

Existing cabinet rectifier as a common power source

- For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 8-6 illustrates a common power supply arrangement for the upgraded system. This includes both Option 21E modules and the existing cabinet. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

Figure 8-6**Typical arrangement using a common DC power supply with optional battery backup**

Note: Each DC power feed to the Meridian 1 consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduit.

Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 21E modules.

These cables connect the System Monitor to the SDI Paddle Board in the CPU/Network module. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Layout alarm cables as shown in figures 8-11, 8-12 and 8-13.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section '**Separate power source**' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150) cable (see Figure 8-14) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL15 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 21E system:

- 1 Power up and initially load the Option 21E column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.

- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
- 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
- 4 The Meridian 1 Option 21E system is now operational.

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 21E column.

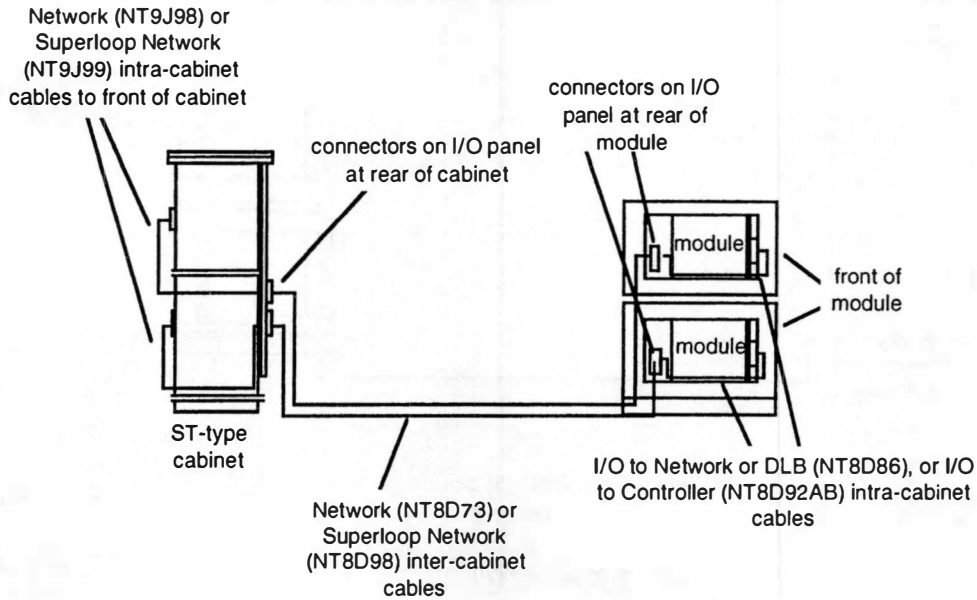
CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

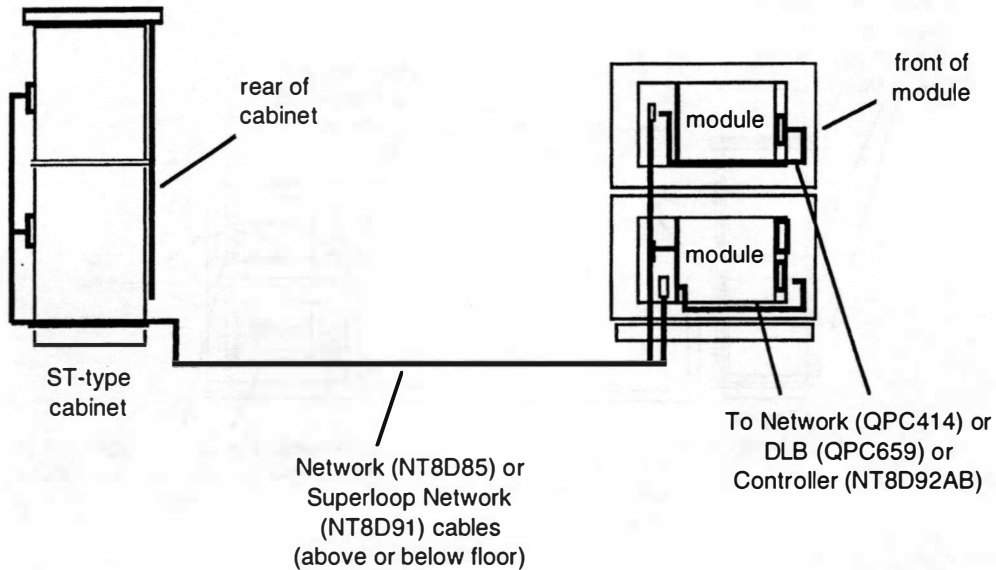
- 1 If EMI regulations apply to the existing cabinet, install the NT9J98 and NT8D73 cable(s) as follows:(see Figure 8-7)
 - Feed the hooded end of the NT9J98 cable(s) through the rear EMI panel of the cabinet.
 - Attach the I/O panel end of the NT9J98 cable(s) to the rear EMI panel (see Figure 8-9).
 - Layout the hooded end of the NT9J98 cable(s) to the DLB card in the cabinet.
 - If two NT9J98 cables are mounted at a single I/O panel opening, attach the support plate provided with the NT9J98 cable using the screws also provided (see Figure 8-10).
 - Connect the NT8D73 cable(s) to the NT9J98 cable(s). Secure the connection with the bail locks on the NT9J98 cable(s).
 - Connect the other end the NT8D73 cable(s) to its assigned connector on the Meridian 1 module. Each loop requires one cable.
- 2 This step applies only if the existing cabinet is not subject to EMI regulations.(see Figure 8-8)
 - Layout a NT8D85 cable between the QPC414 Network Card and the DLB card.

Figure 8-7
Cable types and cable routing — EMI suppression



553-3194

Figure 8-8
Cable types and cable routing — without EMI suppression



553-3195

Figure 8-9
Installing NT9J98 cable on EMI panel

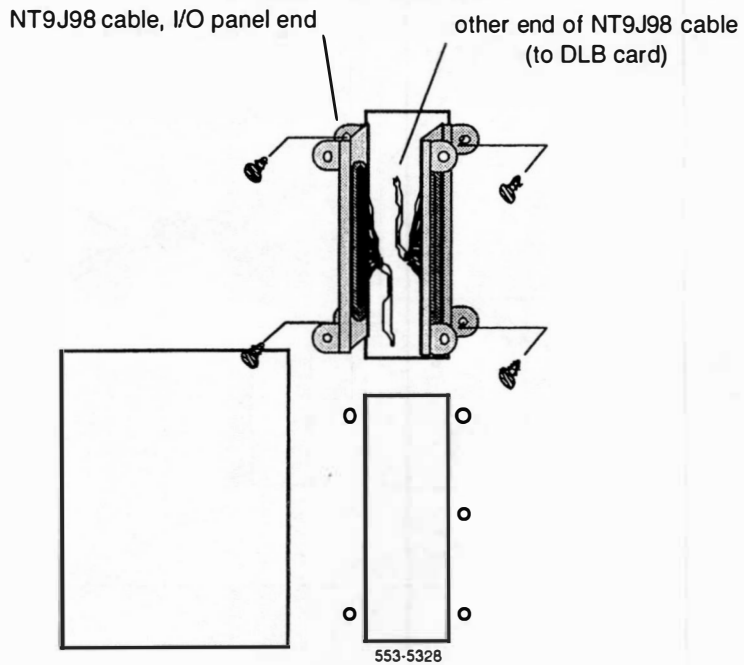
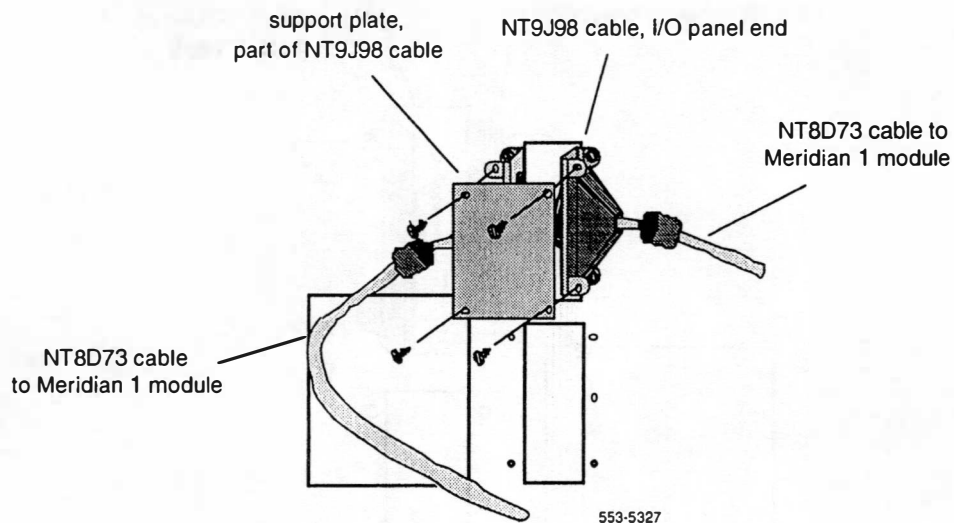


Figure 8-10
Installing NT8D73 cable on EMI panel



Cutting-over

The following procedure describes how to cut-over to the Option 21E system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.
Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.
 - **QBL24**
Set the circuit breaker on the battery unit to OFF.
Set the circuit breaker on the rectifier in the QCA136/QCA137 to off
 - **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
 - **AC powered modules**
Set the AC power supply breaker at the AC power service panel to OFF.
- 2 Connect the previously prepared network cables to their assigned Peripheral Buffer or Controller card in the existing cabinet.
- 3 This step applies only to Meridian 1 modules connected to a DC power source.

CAUTION

When a **common** DC power source is used, **do not** connect a TRIP lead to the existing QCA136 or 137 cabinet.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150) cable (see Figure 8-14) from connector J4 to:

- the MFA150 as described in 553-3001-210,
System Installation Procedures,
or
- the QBL15 as described in the Appendix A, 553-3001-210,
Installing and connecting.

- 4 Go to the next procedure and connect the system monitor according to the system configuration. There are three configurations described. They are:

Configuration 1 — QCA136 cabinet and CE/PE Module

Configuration 2 — QCA137 cabinet and CE/PE Module

Configuration 3 — QCA136, QCA137 cabinet and CE/PE Module

Connecting system monitor

The following three procedures describe the method of connecting the system monitor to each of the three possible ST configurations.

Configuration 1

Connecting system monitor ST system with QCA136 and CE/PE Module

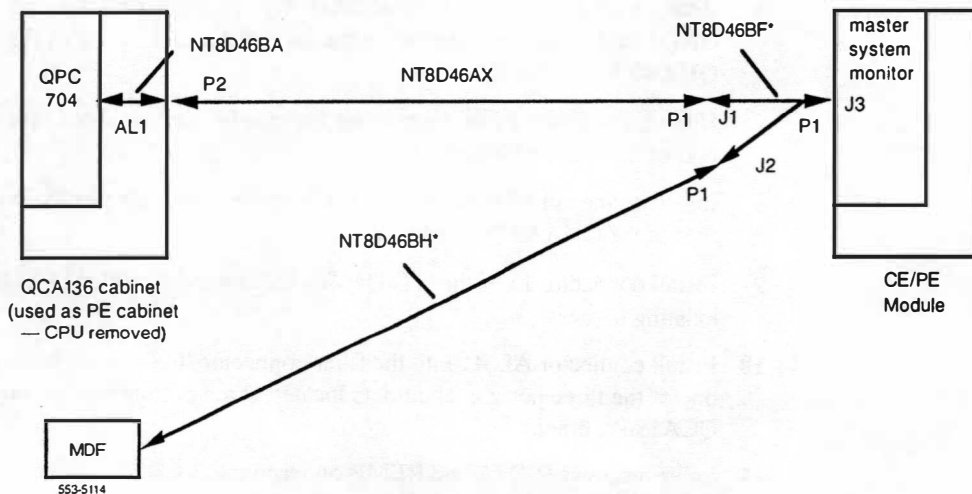
The following procedure describes how to connect the system monitor in an ST system equipped with a QCA136 cabinet and a CE/PE Module. The CPU is located in the module.

Note: This procedure requires removing the EMI back panel from the cabinet. If alarm monitor connections to the MDF are not required for remote alarm, CE alarm, SYSIN/SYSOUT or power fail transfer, skip steps 1 through 4 and directly install connector P1 of the NT8D46AX cable into connector J3 of the system monitor, ensuring the connections with a screwdriver.

- 1 Install connector P1 of the NT8D46AX cable into connector J1 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 2 Install connector P1 of the NT8D46BF cable into connector J3 of the system monitor. Ensure the connection with a screwdriver.
- 3 Install connector P1 of the NT8D46BH cable into connector J2 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 4 Terminate the other end of the NT8D46BH cable.
- 5 Remove the QCA136 rear panels.
- 6 Remove the QCA136 EMI back panel. Verify that the GND1 and GND2 cables are tied together on the ground bar at the back of the QUAA3 Power Unit.
- 7 Unplug connector P5 of the existing harness from connector J5 on the rear of the QUAA3 Power Unit.
- 8 Install connector P5 of the NT8D46BA cable into connector J5 on the rear of the QUAA3 Power Unit.
- 9 Install connector J5 of the NT8D46BA cable into connector P5 of the existing harness.
- 10 Install connector ALM1 into the filter connector (P0678258) located in one of the three horizontal cutouts located at the bottom rear of the QCA136 cabinet.
- 11 Loosen screws REMA and REMB on terminal block TB2 of the QUX19 Power Distribution Unit.
- 12 Connect lug REMA (yellow wire) from the NT8D46BA cable to screw REMA on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw REMA.
- 13 Connect lug REMB (black wire) from the NT8D46BA cable to screw REMB on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw REMB.

- 14 Loosen one of the ground lugs located on the ground bar on the rear of the QUAA3 Power Unit with a 7/16" socket driver.
- 15 Connect the GND ring lug (2 black wires) to the loosened ground lug on the rear of the QUAA3 Power Unit and tighten with the socket driver.
- 16 Reinstall the EMI back panel.
- 17 Reinstall the QCA136 rear panels.
- 18 Restore power to the cabinet and column by reinserting the removed fuse and resetting all circuit breakers to on. Verify that all alarm LEDs on the QUAA3 Power Unit are on, except the CE/PE 1 LED which is on after approximately 90 seconds. Verify that the maintenance console displays message:
PWR0055 00 0 0

Figure 8-11
Connecting system monitor — Configuration 1



* NT8D46BF and NT8D46BH are used only if connections to the MDF are required.

Fault clearing

After powering up the system and sysloading is complete, wait 90 seconds then verify the following:

- 1 The PFTU (if installed) is not activated.
- 2 All LEDs on the QUAA3 Power Unit stay on. If not, verify that steps 13 through 22 of the installation procedure have been completed.
- 3 The LED on the top cap of the CE/PE Module is off. If not, perform one of the following:
 - unseat the system monitor, verify the switch settings (Table 8-3), and reinstall it into the pedestal
 - use LD37, Input/Output Diagnostic, and issue the command "STAT XSM" to identify the fault. See *X11 input/output guide* (553-3001-400).

To verify the installation, perform the following optional procedure on the CE/PE Module:

- 1 Locate the blower unit inside the pedestal of the CE/PE Module.
- 2 Set the circuit breaker on the blower unit to off. Verify the following:
 - the LED on the top cap is on
 - all LEDs on the QUAA3 Power Unit stay on.
 - the maintenance console displays message:
PWR0006 FANU 00 0 0
- 3 Set the circuit breaker on the blower unit back on. Verify that the LED on the top cap is off, and the maintenance console displays message:
PWR0046 FANU 00 0 0
- 4 Perform a data dump using LD43.
- 5 Perform a sysload on the CE/PE Module. Verify the following:
 - the CE/PE 1 LED on the QUAA3 Power Unit is off
 - the PFTU (if installed) is activated
 - the LED on the top cap of the CE/PE Module is on
 - the LEDs on all ringing generators are off

6 Wait 90 seconds after the sysload, then verify the following:

- the CE/PE 1 LED is on
- the PFTU (if installed) is deactivated
- the LED on the top cap of the CE/PE Module is off
- the LEDs on all ringing generators are on
- the maintenance console displays messages:

PWR0056 PFTU XX X X
PWR0055 XSMC 00 0 0
PWR0000 PWSP XX X X
(for each ringing generator)

To verify the installation, perform the following optional procedure on the QCA136 cabinet:

1 Hardware disable the QPC659 DLB card and verify the following:

- the PE 2-5 LED on the QUAA3 Power Unit is off
- the LED on the top cap of the CE/PE Module is off
- the maintenance console displays message:

PWR0015 XSMC 00 0 0

2 Hardware enable the QPC659 DLB card. Verify that the PE 2-5 LED is on and the maintenance console displays message:

PWR0055 XSMC 00 0 0

If any test fails, verify that the QCAD309A and NT8D46AY cables are installed properly, and the switch settings on the system monitor are correct for this configuration.

Configuration 2

Connecting system monitor ST system with QCA137 and CE/PE Module

The following procedure describes how to connect the system monitor in an ST system equipped with a QCA137 cabinet and a CE/PE Module. The CPU is located in the module.

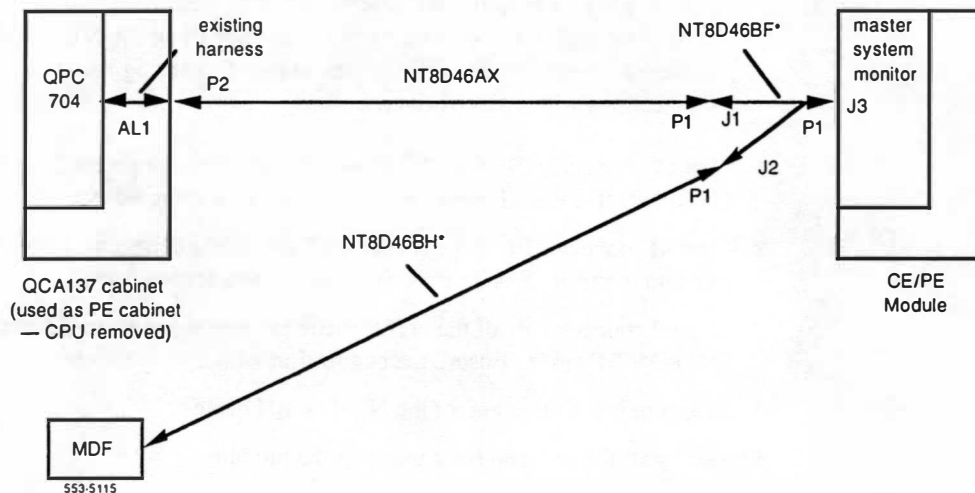
Note: This procedure requires removing the EMI back panel from the cabinet. If alarm monitor connections to the MDF are not required for remote alarm, CE alarm, SYSIN/SYSOUT or power fail transfer, skip steps 1 through 4 and directly install connector P1 of the NT8D46AX cable into connector J3 of the system monitor, ensuring the connections with a screwdriver.

- 1 Install connector P1 of the NT8D46AX cable into connector J1 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 2 Install connector P1 of the NT8D46BF cable into connector J3 of the system monitor. Ensure the connection with a screwdriver.
- 3 Install connector P1 of the NT8D46BH cable into connector J2 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 4 Terminate the other end of the NT8D46BH cable.
- 5 Reinstall the pedestal back panel on the module.
- 6 Remove the QCA137 rear panels.
- 7 Remove the QCA137 EMI back panel. Verify that the GND1 and GND2 cables are tied together on the ground bar at the back of the QUAA3 Power Unit.
- 8 Install connector P2 of the NT8D46AX cable into connector AL1 (P0678258 Filter Connector) at the bottom rear of the QCA137 cabinet. Ensure the connection with a screwdriver.
- 9 Reinstall the EMI back panel.
- 10 Reinstall the QCA137 rear panels.

- 11 Restore power to the cabinet and column by reinserting the removed fuse and resetting all circuit breakers to on. Verify that all alarm LEDs on the QUAA3 Power Unit are on, except the CE/PE 1 LED which is on after approximately 90 seconds. Verify that the maintenance console displays message:

PWR0055 00 0 0

Figure 8-12
Connecting system monitor — Configuration 2



* NT8D46BF and NT8D46BH are used only if connections to the MDF are required.

Fault clearing

After powering up the system and sysloading is complete, wait 90 seconds then verify the following:

- 1 The PFTU (if installed) is not activated.
- 2 All LEDs on the QUAA3 Power Unit stay on. If not, verify cable connections.
- 3 The LED on the top cap of the CE/PE Module is off. If not, perform one of the following:
 - unseat the system monitor, verify the switch settings (Table 8-3), and reinstall it into the pedestal
 - use LD37, Input/Output Diagnostic, and issue the command "STAT XSM" to identify the fault. See *X11 input/output guide* (553-3001-400).

To verify the installation, perform the following optional procedure on the CE/PE Module:

- 1 Locate the blower unit inside the pedestal of the CE/PE Module.
- 2 Set the circuit breaker on the blower unit to off. Verify the following:
 - the LED on the top cap is on
 - all LEDs on the QUAA3 Power Unit stay on.
 - the maintenance console displays message:
PWR0006 FANU 00 0 0
- 3 Set the circuit breaker on the blower unit back on. Verify that the LED on the top cap is off and the maintenance console displays message:
PWR0046 FANU 00 0 0
- 4 Perform a data dump using LD43.
- 5 Perform a sysload on the CE/PE Module. Verify the following:
 - the CE/PE 1 LED on the QUAA3 Power Unit is off
 - the PFTU (if installed) is activated
 - the LED on the top cap of the CE/PE Module is on
 - the LEDs on all ringing generators are off

6 Wait 90 seconds after the sysload, then verify the following:

- the CE/PE 1 LED is on
- the PFTU (if installed) is deactivated
- the LED on the top cap of the CE/PE Module is off
- the LEDs on all ringing generators are on
- the maintenance console displays messages:

PWR0056 PFTU XX X X
PWR0055 XSMC 00 0 0
PWR0000 PWSP XX X X
(for each ringing generator)

To verify the installation, perform the following optional procedure on the QCA137 cabinet:

1 Hardware disable the QPC659 DLB card and verify the following:

- the PE 2-5 LED on the QUAA3 Power Unit is off
- the LED on the top cap of the CE/PE Module is off
- the maintenance console displays message:

PWR0015 XSMC 00 0 0

2 Hardware enable the QPC659 DLB card. Verify that the PE 2-5 LED is on, and the maintenance console displays message:

PWR0055 XSMC 00 0 0

If any test fails, verify that the NT8D46AX cable is installed properly, and the switch settings on the system monitor are correct for this configuration.

Configuration 3

Connecting system monitor ST system with QCA136, QCA137, and CE/PE Module

The following procedure describes how to connect the system monitor in an ST system equipped with a QCA136 cabinet, a QCA137 cabinet, and a CE/PE Module. The CPU is located in the module.

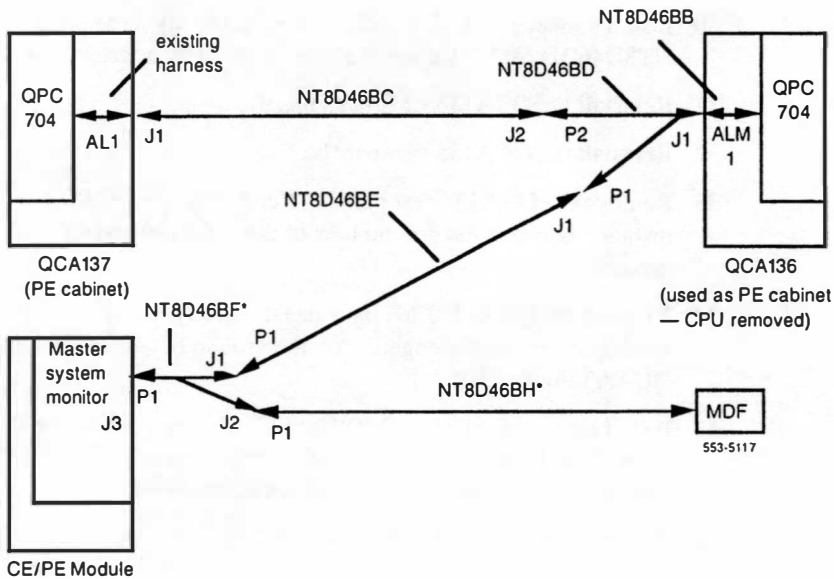
Note: This procedure requires removing the EMI back panels from both cabinets. If alarm monitor connections to the MDF are not required for remote alarm, CE alarm, SYSIN/SYSOUT or power fail transfer, skip steps 1 through 4 and directly install connector P1 of the NT8D46BE cable into connector J3 of the system monitor, ensuring the connections with a screwdriver.

- 1 Install connector P1 of the NT8D46BF cable into connector J3 of the system monitor. Ensure the connection with a screwdriver.
- 2 Install connector P1 of the NT8D46BE cable into connector J1 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 3 Install connector P1 of the NT8D46BH cable into connector J2 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 4 Terminate the other end of the NT8D46BH cable.
- 5 Reinstall the pedestal back panel.
- 6 Remove the QCA136 rear panels.
- 7 Remove the QCA136 EMI back panel. Verify that the GND1 and GND2 cables are tied together on the ground bar at the back of the QUAA3 Power Unit.
- 8 Unplug connector P6 of the existing harness from connector J6 of the QCAD309 Alarm Cable.
- 9 Unplug connector P6 of the QCAD309 Alarm Cable from connector J6 of the QUAA3 Power Unit.
- 10 Unplug connector P4 of the existing harness from connector J4 of the QCAD309 Alarm Cable.
- 11 Unplug connector P4 of the QCAD309 Alarm Cable from connector J4 of the QUAA3 Power Unit.
- 12 Remove connector AL1 of the QCAD309 Alarm Cable from the P0678258 Filter Connector located in one of the three horizontal cutouts at the bottom rear of the QCA136 cabinet.
- 13 Remove the QCA309 Alarm Cable.
- 14 Remove the NE-25MQA1 Alarm Cable connecting the QCA136 and QCA137 cabinets.

- 15 Unplug connector P5 of the existing harness from connector J5 on the rear of the QUAA3 Power Unit.
- 16 Install connector P5 of the NT8D46BB cable into connector J5 on the rear of the QUAA3 Power Unit.
- 17 Install connector J5 of the NT8D46BB cable into connector P5 of the existing harness.
- 18 Install connector P4 of the existing harness into connector J4 on the rear of the QUAA3 Power Unit.
- 19 Unplug connector P6 of the existing harness from connector J6 on the QUAA3 Power Unit.
- 20 Install connector P6 of the NT8D46BB cable into connector J6 on the QUAA3 Power Unit.
- 21 Install connector J6 of the NT8D46BB cable into connector P6 of the existing harness.
- 22 Loosen screws XCE, REMA, and REMB on terminal block TB2 of the QUX19 Power Distribution Unit.
- 23 Connect lug XCE (white wire) from the NT8D46BB cable to screw XCE on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw XCE.
- 23 Connect lug REMA (yellow wire) from the NT8D46BB cable to screw REMA on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw REMA.
- 24 Connect lug REMB (black wire) from the NT8D46BB cable to screw REMB on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw REMB.
- 25 Loosen one of the ground lugs located on the ground bar on the rear of the QUAA3 Power Unit with a 7/16" socket driver.
- 26 Connect the GND ring lug (four black wires) to the loosened ground lug on the rear of the QUAA3 Power Unit and tighten with the socket driver.
- 27 Install connector ALM1 of the NT8D46BB cable into one of the three horizontal cutouts using the existing P0678258 Filter Connector.
- 28 Install connector J1 of the NT8D46BD cable into the P0678258 Filter Connector. Ensure the connection with a screwdriver.

- 29 Install connector J1 of the NT8D46BE cable into connector P1 of the NT8D46BD cable.
- 30 Install connector J2 of the NT8D46BC cable into connector P2 of the NT8D46BD cable. Ensure the connection with a screwdriver.
- 31 Reinstall the QCA136 EMI back panel.
- 32 Reinstall the QCA136 rear panels.
- 33 Remove the QCA137 rear panels. Verify that the QCAD310 cable is installed between the ground bars of the QCA136 and QCA137 cabinets.
- 34 Remove the QCA137 EMI back panel. Verify that the GND1 and GND2 cables are tied together on the ground bar at the back of the QUAA3 Power Unit.
- 35 Install connector J1 of the NT8D46BC cable into connector AL1 (P0678258 Filter Connector) at the bottom rear of the QCA137 cabinet. Ensure the connection with a screwdriver.
- 36 Reinstall the QCA137 EMI back panel.
- 37 Reinstall the QCA137 rear panels.
- 38 Restore power to the cabinet and column by reinserting the removed fuse and resetting all circuit breakers to on. Verify that all alarm LEDs on the QUAA3 Power Unit are on, except the CE/PE 1 LED which is on after approximately 90 seconds. Verify that the maintenance console displays message:
PWR0055 00 0 0

Figure 8-13
Connecting system monitor — Configuration 3



* NT8D46BF and NT8D46BH are used only if connections to the MDF are required.

Fault clearing

After powering up the system and sysloading is complete, wait 90 seconds then verify the following:

- 1 The PFTU (if installed) is not activated.
- 2 All LEDs on the QUAA3 Power Units in the QCA136 and QCA137 cabinets stay on. If not, verify that steps 10, 11, and 14 through 33 of the installation procedure have been completed.
- 3 The LED on the top cap of the CE/PE Module is off. If not, perform one of the following:
 - unseat the system monitor, verify the switch settings (Table 8-3), and reinstall it into the pedestal
 - use LD37, Input/Output Diagnostic, and issue the command "STAT XSM" to identify the fault. See *X11 input/output guide* (553-3001-400).

To verify the installation, perform the following optional procedure on the CE/PE Module:

- 1 Locate the blower unit inside the pedestal of the CE/PE Module.
- 2 Set the circuit breaker on the blower unit to off. Verify the following:
 - the LED on the top cap is on,
 - all LEDs on the QUAA3 Power Units of the QCA136 and QCA137 cabinets stay on
 - the maintenance console displays message:
PWR0006 FANU 00 0 0
- 3 Set the circuit breaker on the blower unit back on. Verify that the LED on the top cap is off and the maintenance console displays message:
PWR0046 FANU 00 0 0
- 4 Perform a data dump using LD43.
- 5 Perform a sysload on the CE/PE Module. Verify the following:
 - all CE/PE 1 LEDs are off
 - the PFTU (if installed) is activated
 - the LED on the top cap of the CE/PE Module is on

- the LEDs on all ringing generators are off
- 6 Wait 90 seconds after the sysload, then verify the following:
- all CE/PE 1 LEDs are on
 - the PFTU (if installed) is deactivated
 - the LED on the top cap of the CE/PE Module is off
 - the LEDs on all ringing generators are on
 - the maintenance console displays messages:
PWR0056 PFTU XX X X
PWR0055 XSMC 00 0 0
PWR0000 PWSP XX X X
(for each ringing generator)

To verify the installation, perform the following optional procedure on the QCA136 cabinet:

- 1 Hardware disable the QPC659 DLB card and verify the following:
- the PE 2-5 LEDs on the QUAA3 Power Units of the QCA136 and QCA137 cabinets stay on
 - the LED on the top cap of the PE Module stays off
 - the maintenance console displays message:
PWR0015 XSMC 00 0 0
- 2 Hardware enable the QPC659 DLB card and verify that the PE 2-5 LEDs on the QUAA3 Power Units of the QCA136 and QCA137 cabinets are on. Verify that the maintenance console displays message:
PWR0055 XSMC 00 0 0

To verify the installation, perform the following optional procedure on the QCA137 cabinet:

1 Hardware disable the QPC659 DLB card and verify the following:

- the PE 2-5 LED on the QUAA3 Power Unit of the QCA137 cabinet is off
- the PE 2-5 LED on the QUAA3 Power Unit of the QCA136 cabinet stays on
- the LED on the top cap of the CE/PE Module stays off
- the maintenance console displays message:

PWR0015 XSMC 00 0 0

2 Hardware enable the QPC659 DLB card and verify that the PE 2-5 LEDs on the QUAA3 Power Units of the QCA136 and QCA137 cabinets are on. Verify that the maintenance console displays message:

PWR0055 XSMC 00 0 0

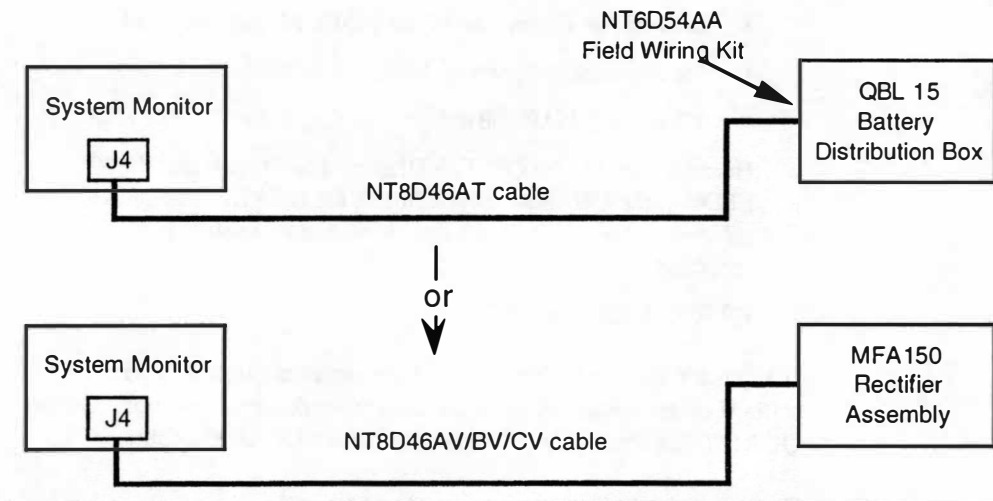
If any test fails, verify that all cables are installed properly, and the switch settings on the system monitor are correct for this configuration. On the QCA137 cabinet, verify the installation of the QCAD310 cable.

To remove equipment no longer required

- 1** Disconnect and remove cables from connectors on the faceplates of the circuit cards located on the CE shelf.
- 2** Remove circuit cards from the CE shelf and store them in a safe place.
- 3** Remove the mass storage unit from the QCA136 cabinet.
- 4** If you are using the CE shelf for DTI/PRI cards:
 - Install DTI/PRI cards in CE shelf card slots 3, 5, 7, 9, and 11.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the CPU/Network module of the Option 21E upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breaker for the CE shelf to ON.
- 5** If you are not going to use the CE shelf for DTI/PRI cards:

- Install the power load card (NT6D81AA) in the CE shelf card slots 2 through 11.
- 6 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Figure 8-14
NT8D46 cable types



SL-1 QCA141 cabinet upgrade to Meridian 1 Option 21E

This procedure is used to upgrade an SL-1 QCA141 cabinet (SN, ST or 21) to Meridian 1 Option 21E. To upgrade to a Meridian 1 Option 21E system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 21E:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 21E operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 21E is operating with the new software provided with the Option 21E.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 21E operational.

However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Hardware upgrade methods

There are two methods of upgrading a QCA141 cabinet to a Meridian 1 Option 21E:

- 1 If the CPU shelf has been previously upgraded to ST or 21 then either the card level or modular upgrade may be performed.
- 2 If the CPU shelf has not been previously upgraded then a modular upgrade must be done.

Card upgrade of SL-1 QCA141 cabinet (ST or 21) to Meridian 1 Option 21E

Equipment required

Table 9-1 lists minimum hardware requirements needed for a card level upgrade of a QCA141 cabinet to a Meridian 1 Option 21E.

Table 9-1

Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT9D33AA	Small System Multi-Drive Unit (SMDU)
1	1	NT9D34AA	Enhanced Multi-Drive System Interface (EMSI)
	1	NT9D47AB	EMSI to SMDU Data Cable, 2 ft (610mm)
1		or	
	1	NT9D47AD	EMSI to SMDU Data Cable, 6 ft (1830mm)
1	1	NT9D66AB	EMSI to SMDU Power Cable, 2 ft (610mm)
		or	
1	1	NT9D66AD	EMSI to SMDU Power Cable, 6 ft (1830mm)
1	1	NTND01CA	12MB CPU/Memory Card
1	1	NTND02BA	Misc, Dual SDI Peripheral Signaling Pack with
		RIs 2	Battery (MSPS)
1	1	NTND31AA	Daughter board (ROM)
		RIs 3	

Note: The vintages shown on circuit cards in Table 9-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

Summary of steps to upgrade

Upgrading consists of:

- removal of CPU/MEM, PS, FDI and FDU
- installation of Option 21E cards and cables
- sysload

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

Removal of CPU/MEM, PS, FDI and FDU

To remove cards:

- 1 Remove software disks from the Floppy Disk Unit.
- 2 Disconnect the cable from the faceplate of the FDI and FDU.
- 3 Set the ENB/DIS switches on cards located in slots 1, 2, 3 and 4 to DIS.
5. Remove the NTND01 CPU/Memory card.

Installation of Option 21E equipment

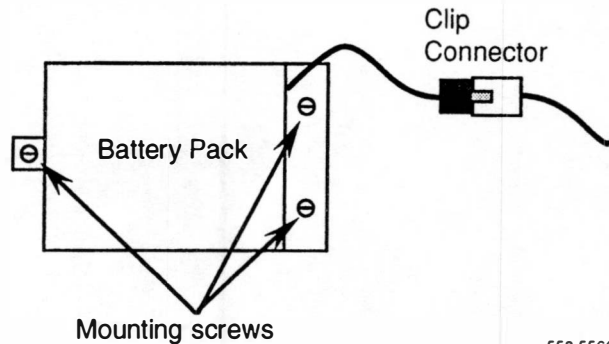
To install Option 21E cards and cables:

- 1 Set the ENB/DIS switch on the NT9D34 EMSI card to DIS.
- 2 Mount the appropriate software cartridge on the EMSI card and set option switches 1, 5, 7 and 8 to ON.
- 3 Install EMSI card in card slot 3 and set the ENB/DIS switch to ENB.
- 4 Install the NTND31AA ROM card onto the NTND01CA CPU/Memory card:
 - Carefully plug the ROM card into the pin connector.
 - Install the screw and washer at each corner of the ROM card.
- 5 Install the CPU/Memory card in card slot 2.
- 6 Set the ENB/DIS switch on the MSPS card to DIS.
- 7 Set option switches on the MSPS card to activate SDI ports. To avoid conflicting addresses, determine the appropriate option switch settings, refer to *Circuit card installation and testing* (553-3001-211).

- 8 Connect the battery pack on the NTND02BA MSPS card by plugging the battery clip connector to the clip connector on the board as illustrated in Figure 9-1.

Note: The battery will not be fully charged until 24 hours after installation in a powered system.

Figure 9-1
Battery pack connection to the MSPS



- 9 Install the NTND02BA MSPS card in slot 4.
- 10 Connect the NTND37 Dual SDI cable to the connector on the NTND02BA MSPS faceplate.
- 11 Set the ENB/DIS switch on the NTND02BA MSPS card to ENB.
- 12 Install the NT9D33 SMDU in its assigned position in the CE shelf. The SMDU may be installed in an alternate location such as the old network shelf in position 6 or any available PE slots, provided the NT9D47 and NT9D66 interface cables will reach from the SMDU to the EMSI.

Sysload

Before you sysload the system, review installation steps and verify that all circuit cards are in the appropriate card slots, ENB/DIS switches are set to ENB, and all cables are properly connected.

- 1 To sysload the system insert the floppy disks into disk drives and press Rld on the CPU/MEM card.
- 2 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Modular upgrade of SL-1 QCA141 cabinet (SN, ST or 21) to Meridian 1 Option 21E

Equipment required

Table 9-2 lists minimum hardware requirements needed to modular upgrade a QCA141 cabinet to a Meridian 1 Option 21E.

Table 9-2
Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT6D43AA or NT7D04AA Rls 3	CE/PE power supply DC
		NT7D00AA	Top cap AC
1	1	NT7D00BA Rls 2	Top cap DC
	1	NT7D09CA	Pedestal DC
1		NT7D14AA or NT8D29AA Rls 4	CE/PE power supply AC
		NT8D11AB Rls 2	CE/PE module AC
1	1	NT8D11DC	CE/PE module DC
		NT8D27AB Rls 3	Pedestal AC
1	1	NT8D22AC	System monitor
1		NT8D52AA	Pedestal blower unit AC
1	1	NT8D52DC	Pedestal blower unit DC (DC system)
		NT8D53AB Rls 5	Power distribution AC
-continued-			

Table 9-2 (continued)

Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT8D17AA Rls 9	Conference/TDS circuit card
1	1	NT8D18AA Rls 9	Digitone Receiver Network card
1	1	NT8D41AA Rls 2	2 Port SDI Paddle Board
1	1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	1	NT8D46AL	System monitor serial link cable
1	1	NT8D46BH	System monitor to SDI cable
1	1	NT8D46AX	System Monitor Cable
		QCA141 cabinet or QCA137 cabinet and CE/PE module (see Figure 9-11 and 9-12)	
		or	or
		NT8D46BC	QCA141 and QCA137 cabinets and CE/PE module (see Figure 9-13)
1	1	NT8D82	MSPS to I/O cable
3	3	NT8D84AA	SDI Paddle Board to I/O Cable
1	1	NT8D95AJ	SDI I/O panel to DTE/DCE, 16 ft (4875 mm)
1	1	NT9D33AA	Small System Multi-Drive Unit (SMDU)
1	1	NT9D34AA	Enhanced Multi-Drive System Interface (EMSI)
	1	NT9D47AB	EMSI to SMDU Data Cable, 2 ft (610mm)
1		or	
	1	NT9D47AD	EMSI to SMDU Data Cable, 6 ft (1830mm)
1	1	NT9D66AB	EMSI to SMDU Power Cable, 2 ft (610mm)
		or	
1	1	NT9D66AD	EMSI to SMDU Power Cable, 6 ft (1830mm)
1	1	NTND01CA	12MB CPU/Memory Card
1	1	NTND02BA Rls 2	Misc, Dual SDI Peripheral Signaling Pack with Battery (MSPS)
1	1	NTND31AA Rls 3	ROM daughter board

1	1	NTND37AA	MSPS I/O to DTE/DCE cable 8 ft (2440 mm)
1	1	QPC84Q	Power Monitor

Note: The vintages shown on circuit cards in Table 9-2 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA141 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 21E Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 21E to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 21E to the existing cabinet.
- An NT9J98 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 21E system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 9-2 shows a typical QCA141 cabinet and Figure 9-3 shows a QCA141 cabinet that has been upgraded to Meridian 1 Option 21E.

Figure 9-2
Typical QCA141 cabinet

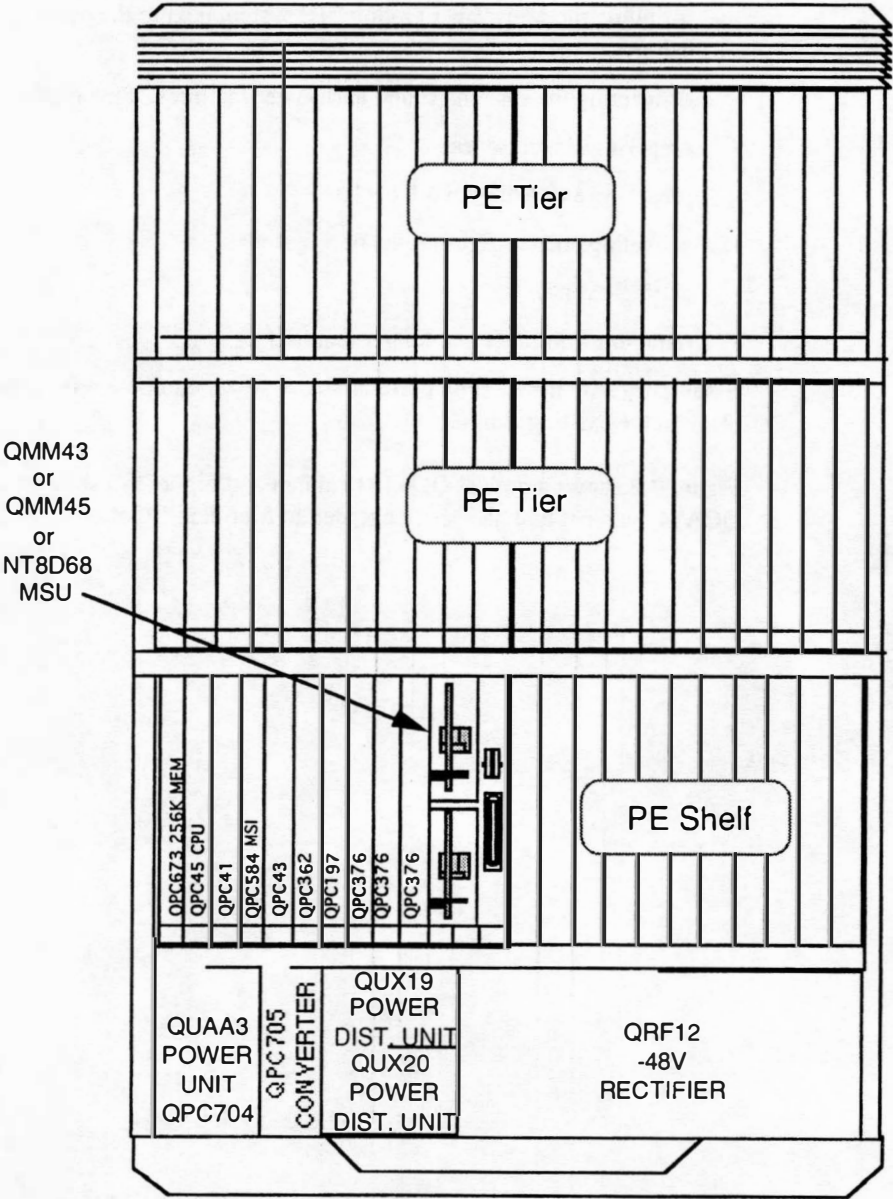
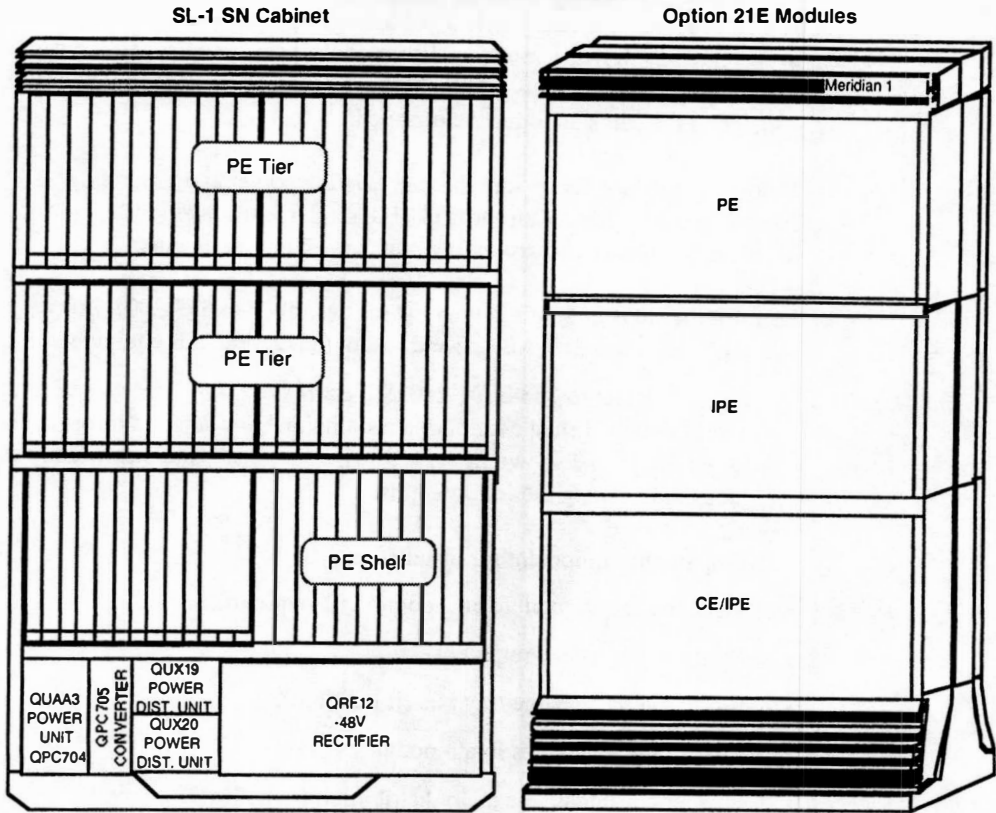


Figure 9-3

Typical QCA141 cabinet that has been upgraded to Meridian 1 Option 21E



Installing the Meridian 1 Option 21E system

The Option 21E equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, CPU/Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 21E equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 9-3 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.

- Install cabling:
 - Cable common equipment
 - Cable network loops (within the Option 21E columns only).
- Note:* Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.
- Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 21E equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 9-4 shows Option 21E circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 9-3
NT8D22 SW1 system monitor switch settings for upgraded systems

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 9-3 (continued)**NT8D22 SW1 system monitor switch settings for upgraded systems**

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.

NT8D22 SW2

SW2 indication	Position							
	1	2	3	4	5	6	7	8
Master system monitor	on							
Slave system monitor	off							
Operation with ST, STE, or RT		on						
All other operation		off						
For master, indicates total number of slaves			Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."					
For each slave, indicates the slave address			Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."					

NT8D22 SW3

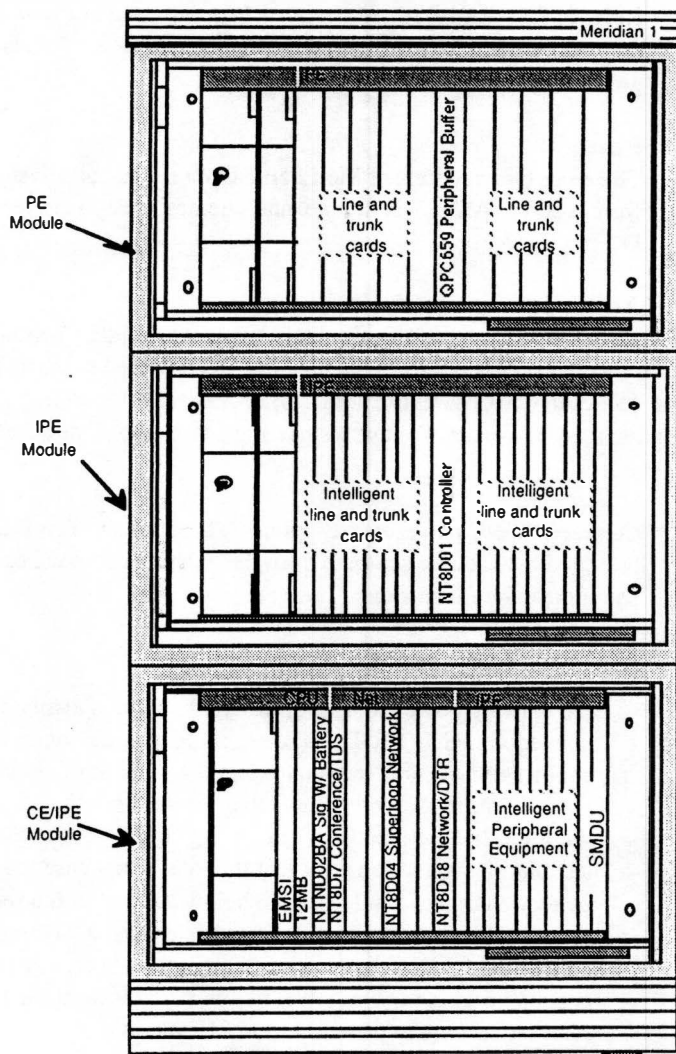
SW3 indication		Position			
		1	2	3	4
CTA	master	on			
	slave	off			
CTR	master		on		
	slave		off		
FAIL	master			on	
	slave			off	
MAJOR	master				on
	slave				off

NT8D22 settings for total number of slaves — SW2 on master

How many slave units		Switch position						How many slave units		Switch position					
		3	4	5	6	7	8			3	4	5	6	7	8
0		on	on	on	on	on	on	32		off	on	on	on	on	on
1		on	on	on	on	on	off	33		off	on	on	on	on	off
2		on	on	on	on	off	on	34		off	on	on	on	off	on
3		on	on	on	on	off	off	35		off	on	on	on	off	off
4		on	on	on	off	on	on	36		off	on	on	off	on	on
5		on	on	on	off	on	off	37		off	on	on	off	on	off
6		on	on	on	off	off	on	38		off	on	on	off	off	on
7		on	on	on	off	off	off	39		off	on	on	off	off	off
8		on	on	off	on	on	on	40		off	on	off	on	on	on
9		on	on	off	on	on	off	41		off	on	off	on	on	off
10		on	on	off	on	off	on	42		off	on	off	on	off	on
11		on	on	off	on	off	off	43		off	on	off	on	off	off
12		on	on	off	off	on	on	44		off	on	off	off	on	on
13		on	on	off	off	on	off	45		off	on	off	off	on	off
14		on	on	off	off	off	on	46		off	on	off	off	off	on
15		on	on	off	off	off	off	47		off	on	off	off	off	off
16		on	off	on	on	on	on	48		off	off	on	on	on	on
17		on	off	on	on	on	off	49		off	off	on	on	on	off
18		on	off	on	on	off	on	50		off	off	on	on	off	on
19		on	off	on	on	off	off	51		off	off	on	on	off	off
20		on	off	on	off	on	on	52		off	off	on	off	on	on
21		on	off	on	off	on	off	53		off	off	on	off	on	off
22		on	off	on	off	off	on	54		off	off	on	off	off	on
23		on	off	on	off	off	off	55		off	off	on	off	off	off
24		on	off	off	on	on	on	56		off	off	off	on	on	on
25		on	off	off	on	on	off	57		off	off	off	on	on	off
26		on	off	off	on	off	on	58		off	off	off	on	off	on
27		on	off	off	on	off	off	59		off	off	off	on	off	off
28		on	off	off	off	on	on	60		off	off	off	off	on	on
29		on	off	off	off	on	off	61		off	off	off	off	on	off
30		on	off	off	off	off	on	62		off	off	off	off	off	on
31		on	off	off	off	off	off	63		off	off	off	off	off	off

NT8D22 slave address — SW2 on slave

Slave unit address	Position						Slave unit address	Position					
	3	4	5	6	7	8		3	4	5	6	7	8
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
32	off	on	on	on	on	on							

Figure 9-4**Meridian 1 Option 21E CPU/IPE module with IPE and PE modules**

Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 21E: one designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 21E, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Connect the DC power to the Option 21E columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

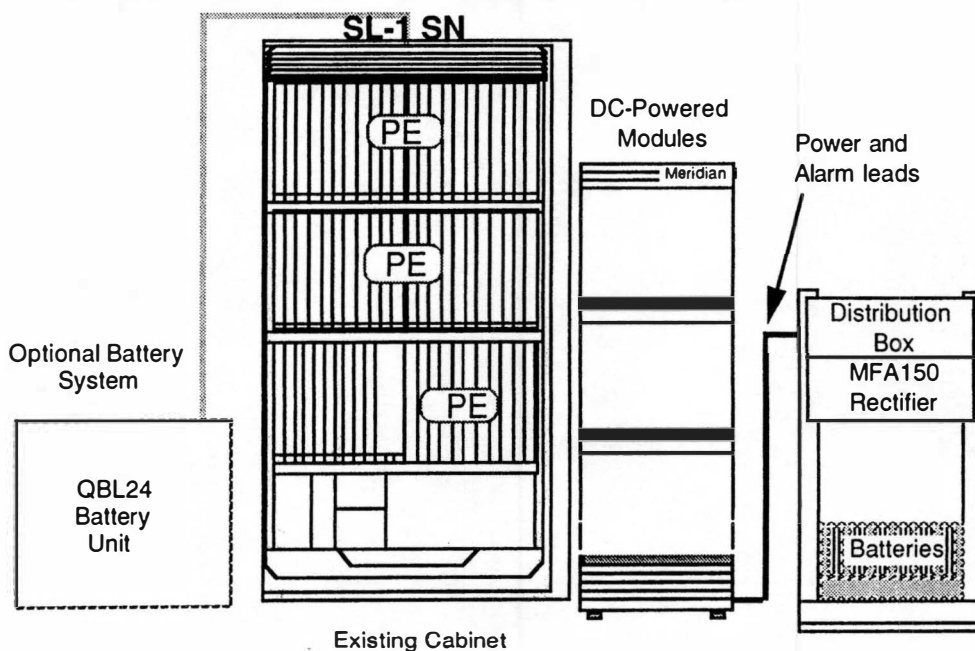
- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 21E equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 21E module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 21E modules.
- a new power source installed in conjunction with the Option 21E.

To determine the power requirements for the Option 21E system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 9-5 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 21E modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 21E column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 9-5
Typical arrangement of independently DC-powered Meridian 1 Option 21E modules



Note: An MFA150 cannot share a battery string connected to QBL24, or QBL15. A separate battery string is required for the MFA150.

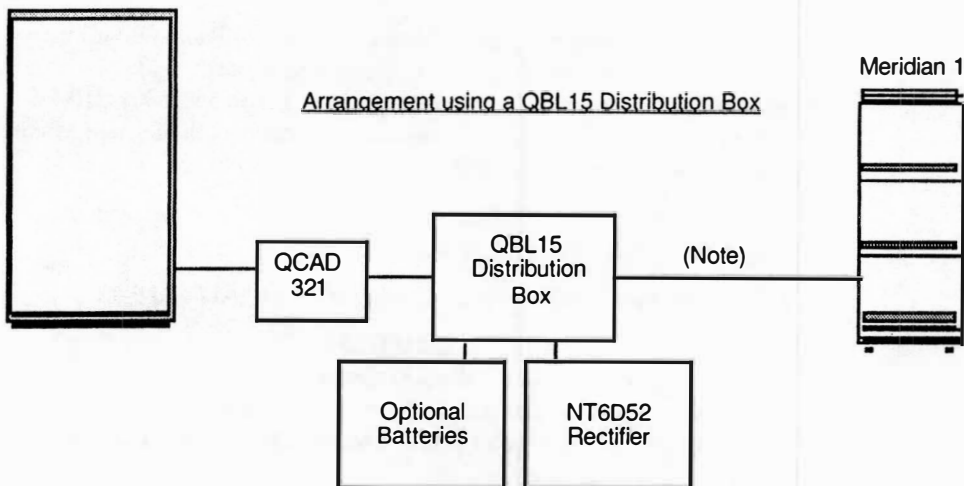
Common power source

Existing cabinet rectifier as a common power source

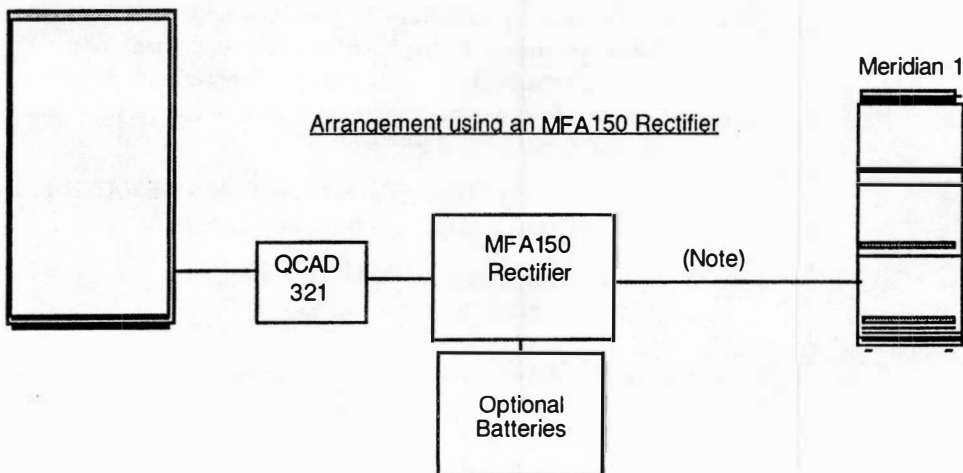
- For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 9-6 illustrates a common power supply arrangement for the upgraded system. This includes both Option 21E modules and the existing cabinet. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

Figure 9-6**Typical arrangement using a common DC power supply with optional battery backup**

Existing Cabinet



Existing Cabinet



Note: Each DC power feed to the Meridian 1 consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduit.

Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 21E modules.

These cables connect the System Monitor to the SDI Paddle Board in the CPU/Network module. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Layout alarm cables as shown in figures 9-11, 9-12 and 9-13.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section 'Separate power source' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150) cable (see Figure 9-14) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL15 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 21E system:

- 1 Power up and initially load the Option 21E column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.
- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
- 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
- 4 The Meridian 1 Option 21E system is now operational.

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 21E column.

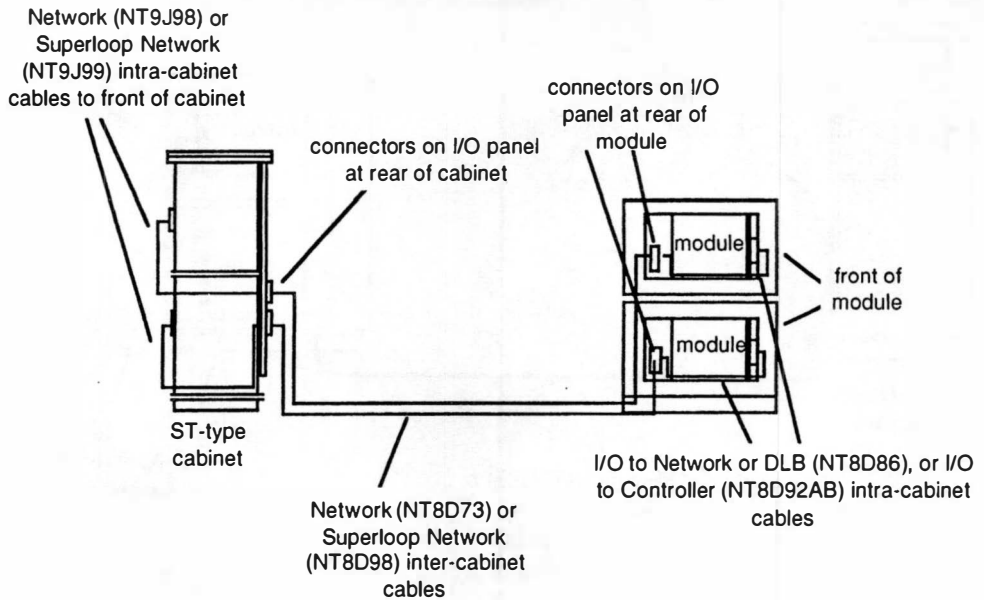
CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

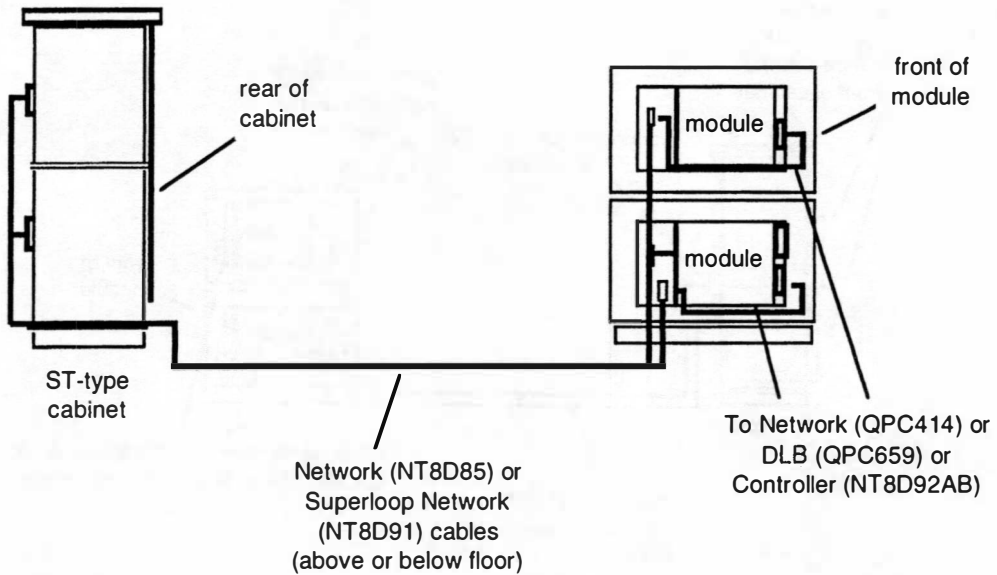
- 1 If EMI regulations apply to the existing cabinet, install the NT9J98 and NT8D73 cable(s) as follows:(see Figure 9-7)
 - Feed the hooded end of the NT9J98 cable(s) through the rear EMI panel of the cabinet.
 - Attach the I/O panel end of the NT9J98 cable(s) to the rear EMI panel (see Figure 9-9).
 - Layout the hooded end of the NT9J98 cable(s) to the DLB card in the cabinet.
 - If two NT9J98 cables are mounted at a single I/O panel opening, attach the support plate provided with the NT9J98 cable using the screws also provided (see Figure 9-10).
 - Connect the NT8D73 cable(s) to the NT9J98 cable(s). Secure the connection with the bail locks on the NT9J98 cable(s).
 - Connect the other end the NT8D73 cable(s) to its assigned connector on the Meridian 1 module. Each loop requires one cable.
- 2 This step applies only if the existing cabinet is not subject to EMI regulations.(see Figure 9-8)
 - Layout a NT8D85 cable between the QPC414 Network Card and the DLB card.

Figure 9-7
Cable types and cable routing — EMI suppression



553-3194

Figure 9-8
Cable types and cable routing — without EMI suppression



553-3195

Figure 9-9
Installing NT9J98 cable on EMI panel

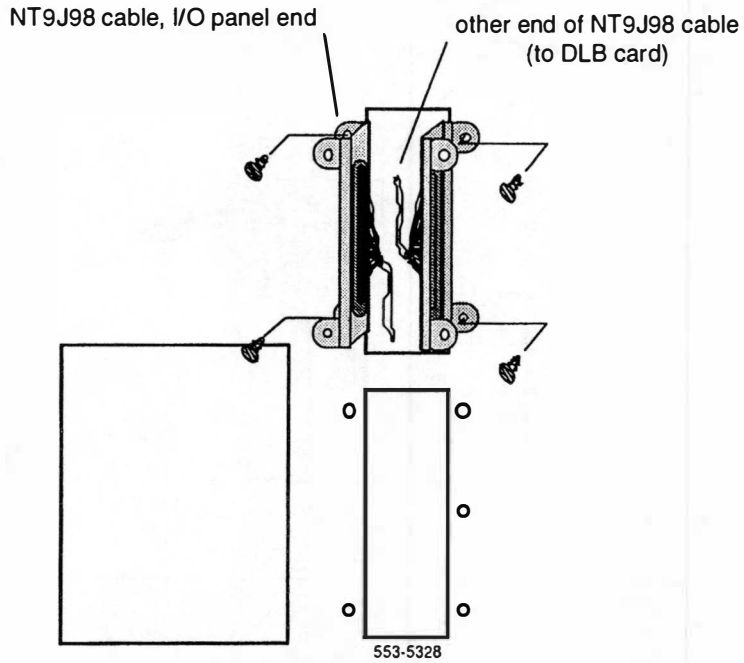
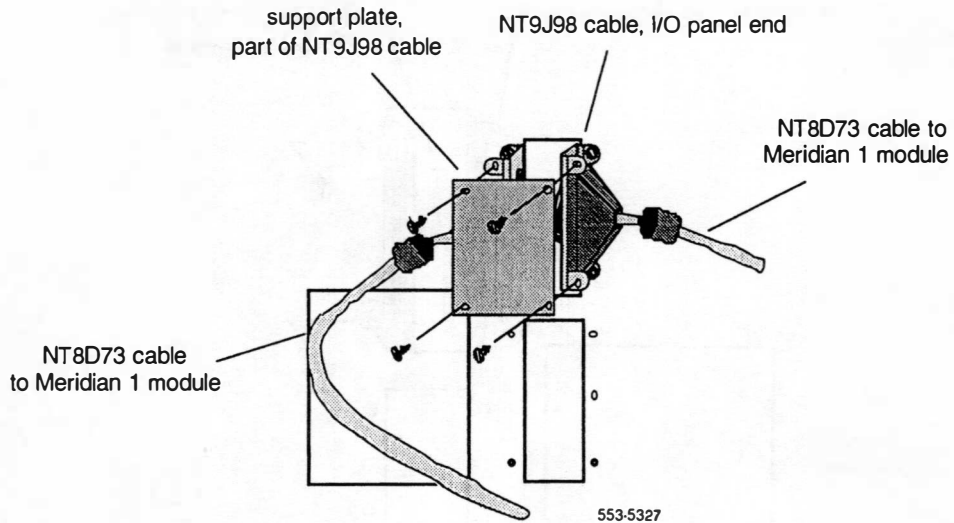


Figure 9-10

Installing NT8D73 cable on EMI panel



Cutting-over

The following procedure describes how to cut-over to the Option 21E system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.
Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.
 - **QBL24**
Set the circuit breaker on the battery unit to OFF.
Set the circuit breaker on the rectifier in the QCA141/QCA137 to off
 - **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
 - **AC powered modules**
Set the AC power supply breaker at the AC power service panel to OFF.
- 2 Connect the previously prepared network cables to their assigned Peripheral Buffer or Controller card in the existing cabinet.
- 3 This step applies only to Meridian 1 modules connected to a DC power source.

CAUTION

When a **common** DC power source is used, **do not** connect a TRIP lead to the existing QCA141 or 137 cabinet.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150) cable (see Figure 9-14) from connector J4 to:

- the MFA150 as described in 553-3001-210,
System Installation Procedures,
- or
- the QBL15 as described in the Appendix A, 553-3001-210,
Installing and connecting.

- 4 Go to the next procedure and connect the system monitor according to the system configuration. There are three configurations described. They are:

Configuration 1 — QCA141 cabinet and CE/PE Module

Configuration 2 — QCA137 cabinet and CE/PE Module

Configuration 3 — QCA141, QCA137 cabinet and CE/PE Module

Connecting system monitor

The following three procedures describe the method of connecting the system monitor to each of the three possible ST configurations.

Configuration 1

Connecting system monitor SN system with QCA141 and CE/PE Module

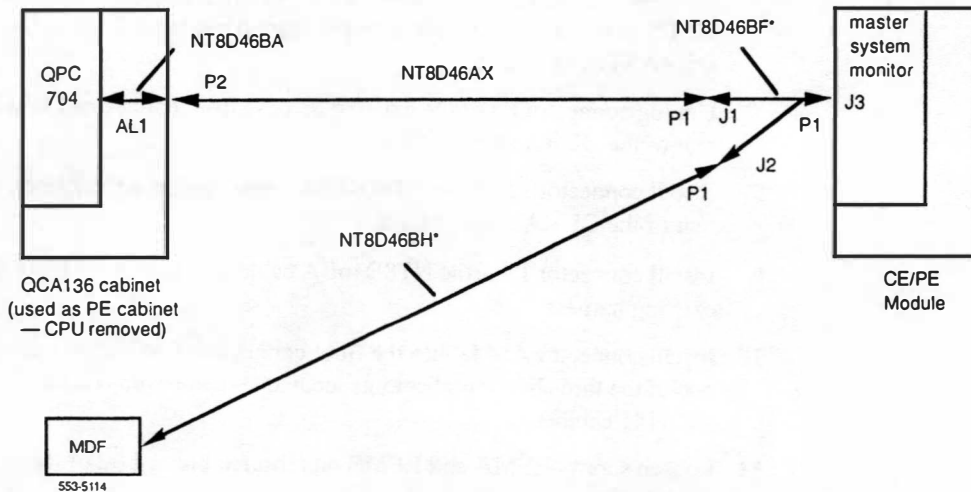
The following procedure describes how to connect the system monitor in an SN system equipped with a QCA141 cabinet and a CE/PE Module. The CPU is located in the module.

Note: This procedure requires removing the EMI back panel from the cabinet. If alarm monitor connections to the MDF are not required for remote alarm, CE alarm, SYSIN/SYSOUT or power fail transfer, skip steps 1 through 4 and directly install connector P1 of the NT8D46AX cable into connector J3 of the system monitor, ensuring the connections with a screwdriver.

- 1 Install connector P1 of the NT8D46AX cable into connector J1 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 2 Install connector P1 of the NT8D46BF cable into connector J3 of the system monitor. Ensure the connection with a screwdriver.
- 3 Install connector P1 of the NT8D46BH cable into connector J2 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 4 Terminate the other end of the NT8D46BH cable.
- 5 Remove the QCA141 rear panels.
- 6 Remove the QCA141 EMI back panel. Verify that the GND1 and GND2 cables are tied together on the ground bar at the back of the QUAA3 Power Unit.
- 7 Unplug connector P5 of the existing harness from connector J5 on the rear of the QUAA3 Power Unit.
- 8 Install connector P5 of the NT8D46BA cable into connector J5 on the rear of the QUAA3 Power Unit.
- 9 Install connector J5 of the NT8D46BA cable into connector P5 of the existing harness.
- 10 Install connector ALM1 into the filter connector (P0678258) located in one of the three horizontal cutouts located at the bottom rear of the QCA141 cabinet.
- 11 Loosen screws REMA and REMB on terminal block TB2 of the QUX19 Power Distribution Unit.
- 12 Connect lug REMA (yellow wire) from the NT8D46BA cable to screw REMA on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw REMA.
- 13 Connect lug REMB (black wire) from the NT8D46BA cable to screw REMB on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw REMB.

- 14 Loosen one of the ground lugs located on the ground bar on the rear of the QUAA3 Power Unit with a 7/16" socket driver.
- 15 Connect the GND ring lug (2 black wires) to the loosened ground lug on the rear of the QUAA3 Power Unit and tighten with the socket driver.
- 16 Reinstall the EMI back panel.
- 17 Reinstall the QCA141 rear panels.
- 18 Restore power to the cabinet and column by reinserting the removed fuse and resetting all circuit breakers to on. Verify that all alarm LEDs on the QUAA3 Power Unit are on, except the CE/PE 1 LED which is on after approximately 90 seconds. Verify that the maintenance console displays message:
PWR0055 00 0 0

Figure 9-11
Connecting system monitor — Configuration 1



* NT8D46BF and NT8D46BH are used only if connections to the MDF are required.

Fault clearing

After powering up the system and sysloading is complete, wait 90 seconds then verify the following:

- 1 The PFTU (if installed) is not activated.
- 2 All LEDs on the QUAA3 Power Unit stay on. If not, verify that steps 13 through 22 of the installation procedure have been completed.
- 3 The LED on the top cap of the CE/PE Module is off. If not, perform one of the following:
 - unseat the system monitor, verify the switch settings (Table 7-1), and reinstall it into the pedestal
 - use LD37, Input/Output Diagnostic, and issue the command "STAT XSM" to identify the fault. See *X11 input/output guide* (553-3001-400).

To verify the installation, perform the following optional procedure on the CE/PE Module:

- 1 Locate the blower unit inside the pedestal of the CE/PE Module.
- 2 Set the circuit breaker on the blower unit to off. Verify the following:
 - the LED on the top cap is on
 - all LEDs on the QUAA3 Power Unit stay on.
 - the maintenance console displays message:
PWR0006 FANU 00 0 0
- 3 Set the circuit breaker on the blower unit back on. Verify that the LED on the top cap is off, and the maintenance console displays message:
PWR0046 FANU 00 0 0
- 4 Perform a data dump using LD43.
- 5 Perform a sysload on the CE/PE Module. Verify the following:
 - the CE/PE 1 LED on the QUAA3 Power Unit is off
 - the PFTU (if installed) is activated
 - the LED on the top cap of the CE/PE Module is on
 - the LEDs on all ringing generators are off

6 Wait 90 seconds after the sysload, then verify the following:

- the CE/PE 1 LED is on
- the PFTU (if installed) is deactivated
- the LED on the top cap of the CE/PE Module is off
- the LEDs on all ringing generators are on
- the maintenance console displays messages:

PWR0056 PFTU XX X X
PWR0055 XSMC 00 0 0
PWR0000 PWSP XX X X
(for each ringing generator)

To verify the installation, perform the following optional procedure on the QCA141 cabinet:

1 Hardware disable the QPC659 DLB card and verify the following:

- the PE 2-5 LED on the QUAA3 Power Unit is off
- the LED on the top cap of the CE/PE Module is off
- the maintenance console displays message:

PWR0015 XSMC 00 0 0

2 Hardware enable the QPC659 DLB card. Verify that the PE 2-5 LED is on and the maintenance console displays message:

PWR0055 XSMC 00 0 0

If any test fails, verify that the QCAD309A and NT8D46AY cables are installed properly, and the switch settings on the system monitor are correct for this configuration.

Configuration 2

Connecting system monitor with QCA137 and CE/PE Module

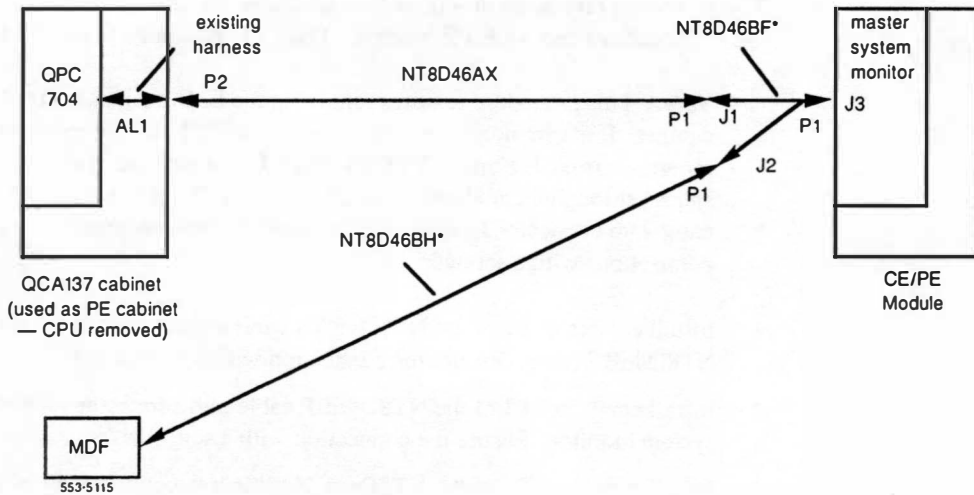
The following procedure describes how to connect the system monitor in a QCA137 cabinet and a CE/PE Module. The CPU is located in the module.

Note: This procedure requires removing the EMI back panel from the cabinet. If alarm monitor connections to the MDF are not required for remote alarm, CE alarm, SYSIN/SYSOUT or power fail transfer, skip steps 1 through 4 and directly install connector P1 of the NT8D46AX cable into connector J3 of the system monitor, ensuring the connections with a screwdriver.

- 1 Install connector P1 of the NT8D46AX cable into connector J1 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 2 Install connector P1 of the NT8D46BF cable into connector J3 of the system monitor. Ensure the connection with a screwdriver.
- 3 Install connector P1 of the NT8D46BH cable into connector J2 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 4 Terminate the other end of the NT8D46BH cable.
- 5 Reinstall the pedestal back panel on the module.
- 6 Remove the QCA137 rear panels.
- 7 Remove the QCA137 EMI back panel. Verify that the GND1 and GND2 cables are tied together on the ground bar at the back of the QUAA3 Power Unit.
- 8 Install connector P2 of the NT8D46AX cable into connector AL1 (P0678258 Filter Connector) at the bottom rear of the QCA137 cabinet. Ensure the connection with a screwdriver.
- 9 Reinstall the EMI back panel.
- 10 Reinstall the QCA137 rear panels.
- 11 Restore power to the cabinet and column by reinserting the removed fuse and resetting all circuit breakers to on. Verify that all alarm LEDs on the QUAA3 Power Unit are on, except the CE/PE 1 LED which is on after approximately 90 seconds. Verify that the maintenance console displays message:

PWR0055 00 0 0

Figure 9-12
Connecting system monitor — Configuration 2



* NT8D46BF and NT8D46BH are used only if connections to the MDF are required.

Fault clearing

After powering up the system and sysloading is complete, wait 90 seconds then verify the following:

- 1 The PFTU (if installed) is not activated.
- 2 All LEDs on the QUAA3 Power Unit stay on. If not, verify cable connections.
- 3 The LED on the top cap of the CE/PE Module is off. If not, perform one of the following:
 - unseat the system monitor, verify the switch settings (Table 7-1), and reinstall it into the pedestal
 - use LD37, Input/Output Diagnostic, and issue the command "STAT XSM" to identify the fault. See *X11 input/output guide* (553-3001-400).

To verify the installation, perform the following optional procedure on the CE/PE Module:

- 1 Locate the blower unit inside the pedestal of the CE/PE Module.
- 2 Set the circuit breaker on the blower unit to off. Verify the following:
 - the LED on the top cap is on
 - all LEDs on the QUAA3 Power Unit stay on.
 - the maintenance console displays message:
PWR0006 FANU 00 0 0
- 3 Set the circuit breaker on the blower unit back on. Verify that the LED on the top cap is off and the maintenance console displays message:
PWR0046 FANU 00 0 0
- 4 Perform a data dump using LD43.
- 5 Perform a sysload on the CE/PE Module. Verify the following:
 - the CE/PE 1 LED on the QUAA3 Power Unit is off
 - the PFTU (if installed) is activated
 - the LED on the top cap of the CE/PE Module is on
 - the LEDs on all ringing generators are off

6 Wait 90 seconds after the sysload, then verify the following:

- the CE/PE 1 LED is on
- the PFTU (if installed) is deactivated
- the LED on the top cap of the CE/PE Module is off
- the LEDs on all ringing generators are on
- the maintenance console displays messages:

PWR0056 PFTU XX X X
PWR0055 XSMC 00 0 0
PWR0000 PWSP XX X X
(for each ringing generator)

To verify the installation, perform the following optional procedure on the QCA137 cabinet:

1 Hardware disable the QPC659 DLB card and verify the following:

- the PE 2-5 LED on the QUAA3 Power Unit is off
- the LED on the top cap of the CE/PE Module is off
- the maintenance console displays message:

PWR0015 XSMC 00 0 0

2 Hardware enable the QPC659 DLB card. Verify that the PE 2-5 LED is on, and the maintenance console displays message:

PWR0055 XSMC 00 0 0

If any test fails, verify that the NT8D46AX cable is installed properly, and the switch settings on the system monitor are correct for this configuration.

Configuration 3

Connecting system monitor SN system with QCA141, QCA137, and CE/PE Module

The following procedure describes how to connect the system monitor in an SN system equipped with a QCA141 cabinet, a QCA137 cabinet, and a CE/PE Module. The CPU is located in the module.

Note: This procedure requires removing the EMI back panels from both cabinets. If alarm monitor connections to the MDF are not required for remote alarm, CE alarm, SYSIN/SYSOUT or power fail transfer, skip steps 1 through 4 and directly install connector P1 of the NT8D46BE cable into connector J3 of the system monitor, ensuring the connections with a screwdriver.

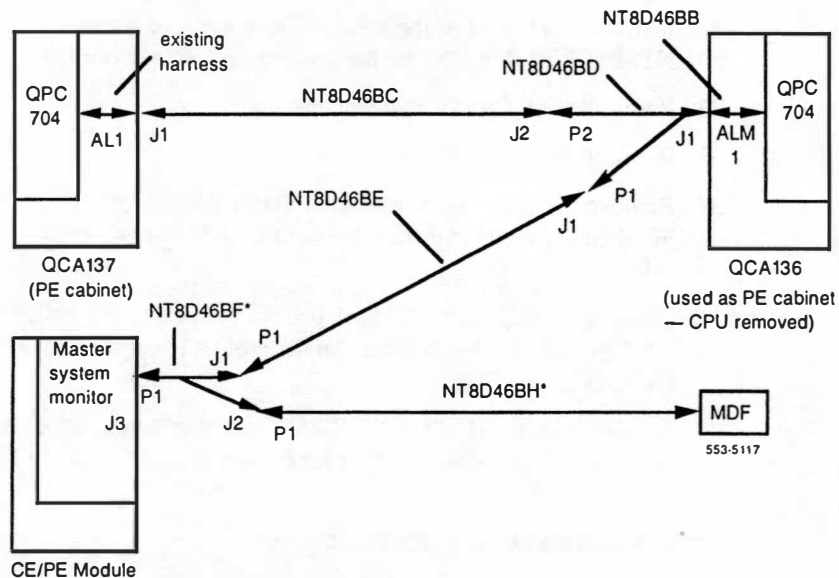
- 1 Install connector P1 of the NT8D46BF cable into connector J3 of the system monitor. Ensure the connection with a screwdriver.
- 2 Install connector P1 of the NT8D46BE cable into connector J1 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 3 Install connector P1 of the NT8D46BH cable into connector J2 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 4 Terminate the other end of the NT8D46BH cable.
- 5 Reinstall the pedestal back panel.
- 6 Remove the QCA141 rear panels.
- 7 Remove the QCA141 EMI back panel. Verify that the GND1 and GND2 cables are tied together on the ground bar at the back of the QUAA3 Power Unit.
- 8 Unplug connector P6 of the existing harness from connector J6 of the QCAD309 Alarm Cable.
- 9 Unplug connector P6 of the QCAD309 Alarm Cable from connector J6 of the QUAA3 Power Unit.
- 10 Unplug connector P4 of the existing harness from connector J4 of the QCAD309 Alarm Cable.
- 11 Unplug connector P4 of the QCAD309 Alarm Cable from connector J4 of the QUAA3 Power Unit.
- 12 Remove connector AL1 of the QCAD309 Alarm Cable from the P0678258 Filter Connector located in one of the three horizontal cutouts at the bottom rear of the QCA141 cabinet.
- 13 Remove the QCA309 Alarm Cable.
- 14 Remove the NE-25MQA1 Alarm Cable connecting the QCA141 and QCA137 cabinets.

- 15 Unplug connector P5 of the existing harness from connector J5 on the rear of the QUAA3 Power Unit.
- 16 Install connector P5 of the NT8D46BB cable into connector J5 on the rear of the QUAA3 Power Unit.
- 17 Install connector J5 of the NT8D46BB cable into connector P5 of the existing harness.
- 18 Install connector P4 of the existing harness into connector J4 on the rear of the QUAA3 Power Unit.
- 19 Unplug connector P6 of the existing harness from connector J6 on the QUAA3 Power Unit.
- 20 Install connector P6 of the NT8D46BB cable into connector J6 on the QUAA3 Power Unit.
- 21 Install connector J6 of the NT8D46BB cable into connector P6 of the existing harness.
- 22 Loosen screws XCE, REMA, and REMB on terminal block TB2 of the QUX19 Power Distribution Unit.
- 23 Connect lug XCE (white wire) from the NT8D46BB cable to screw XCE on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw XCE.
- 24 Connect lug REMA (yellow wire) from the NT8D46BB cable to screw REMA on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw REMA.
- 25 Connect lug REMB (black wire) from the NT8D46BB cable to screw REMB on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw REMB.
- 26 Loosen one of the ground lugs located on the ground bar on the rear of the QUAA3 Power Unit with a 7/16" socket driver.
- 27 Connect the GND ring lug (four black wires) to the loosened ground lug on the rear of the QUAA3 Power Unit and tighten with the socket driver.
- 28 Install connector ALM1 of the NT8D46BB cable into one of the three horizontal cutouts using the existing P0678258 Filter Connector.
- 29 Install connector J1 of the NT8D46BD cable into the P0678258 Filter Connector. Ensure the connection with a screwdriver.

- 30 Install connector J1 of the NT8D46BE cable into connector P1 of the NT8D46BD cable.
- 31 Install connector J2 of the NT8D46BC cable into connector P2 of the NT8D46BD cable. Ensure the connection with a screwdriver.
- 32 Reinstall the QCA141 EMI back panel.
- 33 Reinstall the QCA141 rear panels.
- 34 Remove the QCA137 rear panels. Verify that the QCAD310 cable is installed between the ground bars of the QCA141 and QCA137 cabinets.
- 35 Remove the QCA137 EMI back panel. Verify that the GND1 and GND2 cables are tied together on the ground bar at the back of the QUAA3 Power Unit.
- 36 Install connector J1 of the NT8D46BC cable into connector AL1 (P0678258 Filter Connector) at the bottom rear of the QCA137 cabinet. Ensure the connection with a screwdriver.
- 37 Reinstall the QCA137 EMI back panel.
- 38 Reinstall the QCA137 rear panels.
- 39 Restore power to the cabinet and column by reinserting the removed fuse and resetting all circuit breakers to on. Verify that all alarm LEDs on the QUAA3 Power Unit are on, except the CE/PE 1 LED which is on after approximately 90 seconds. Verify that the maintenance console displays message:

PWR0055 00 0 0

Figure 9-13
Connecting system monitor — Configuration 3



* NT8D46BF and NT8D46BH are used only if connections to the MDF are required.

Fault clearing

After powering up the system and sysloading is complete, wait 90 seconds then verify the following:

- 1 The PFTU (if installed) is not activated.
- 2 All LEDs on the QUAA3 Power Units in the QCA141 and QCA137 cabinets stay on. If not, verify that steps 10, 11, and 14 through 33 of the installation procedure have been completed.
- 3 The LED on the top cap of the CE/PE Module is off. If not, perform one of the following:
 - unseat the system monitor, verify the switch settings (Table 9-3), and reinstall it into the pedestal
 - use LD37, Input/Output Diagnostic, and issue the command "STAT XSM" to identify the fault. See *X11 input/output guide* (553-3001-400).

To verify the installation, perform the following optional procedure on the CE/PE Module:

- 1 Locate the blower unit inside the pedestal of the CE/PE Module.
- 2 Set the circuit breaker on the blower unit to off. Verify the following:
 - the LED on the top cap is on,
 - all LEDs on the QUAA3 Power Units of the QCA141 and QCA137 cabinets stay on
 - the maintenance console displays message:
PWR0006 FANU 00 0 0
- 3 Set the circuit breaker on the blower unit back on. Verify that the LED on the top cap is off and the maintenance console displays message:
PWR0046 FANU 00 0 0
- 4 Perform a data dump using LD43.
- 5 Perform a sysload on the CE/PE Module. Verify the following:
 - all CE/PE 1 LEDs are off
 - the PFTU (if installed) is activated
 - the LED on the top cap of the CE/PE Module is on

- the LEDs on all ringing generators are off
- 6 Wait 90 seconds after the sysload, then verify the following:
- all CE/PE LEDs are on
 - the PFTU (if installed) is deactivated
 - the LED on the top cap of the CE/PE Module is off
 - the LEDs on all ringing generators are on
 - the maintenance console displays messages:
PWR0056 PFTU XX X X
PWR0055 XSMC 00 0 0
PWR0000 PWSP XX X X
(for each ringing generator)

To verify the installation, perform the following optional procedure on the QCA141 cabinet:

- 1 Hardware disable the QPC659 DLB card and verify the following:
- the PE 2-5 LEDs on the QUAA3 Power Units of the QCA141 and QCA137 cabinets stay on
 - the LED on the top cap of the PE Module stays off
 - the maintenance console displays message:
PWR0015 XSMC 00 0 0
- 2 Hardware enable the QPC659 DLB card and verify that the PE 2-5 LEDs on the QUAA3 Power Units of the QCA141 and QCA137 cabinets are on. Verify that the maintenance console displays message:
PWR0055 XSMC 00 0 0

To verify the installation, perform the following optional procedure on the QCA137 cabinet:

1 Hardware disable the QPC659 DLB card and verify the following:

- the PE 2-5 LED on the QUAA3 Power Unit of the QCA137 cabinet is off
- the PE 2-5 LED on the QUAA3 Power Unit of the QCA141 cabinet stays on
- the LED on the top cap of the CE/PE Module stays off
- the maintenance console displays message:

PWR0015 XSMC 00 0 0

2 Hardware enable the QPC659 DLB card and verify that the PE 2-5 LEDs on the QUAA3 Power Units of the QCA141 and QCA137 cabinets are on. Verify that the maintenance console displays message:

PWR0055 XSMC 00 0 0

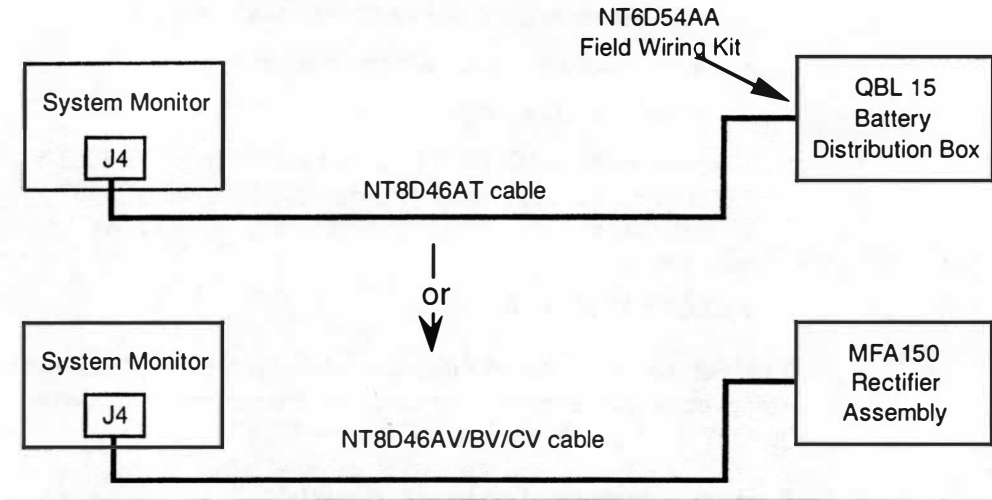
If any test fails, verify that all cables are installed properly, and the switch settings on the system monitor are correct for this configuration. On the QCA137 cabinet, verify the installation of the QCAD310 cable.

To remove equipment no longer required

- 1 Disconnect and remove cables from connectors on the faceplates of the circuit cards located on the CE shelf.
- 2 Remove circuit cards from the CE shelf and store them in a safe place.
- 3 Remove the mass storage unit from the QCA141 cabinet.
- 4 If you are using the CE shelf for DTI/PRI cards:
 - Install DTI/PRI cards in CE shelf card slots 3, 5, 7, 9, and 11.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the CPU/Network module of the Option 21E upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breaker for the CE shelf to ON.
- 5 If you are not going to use the CE shelf for DTI/PRI cards:

- Install the power load card (NT6D81AA) in the CE shelf card slots 2 through 11.
- 6 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Figure 9-14
NT8D46 cable types



Meridian 1 NT8D11 module upgrade to Meridian 1 Option 21E

This procedure is used to upgrade a Meridian 1 Option 21 with an NT8D11 module running X11 release 15 to 17 software to a Meridian 1 Option 21E. To upgrade to a Meridian 1 Option 21E system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 21E:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 21E operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 21E is operating with the new software provided with the Option 21E.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 21E operational.

However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Card upgrade of an NT8D11 module to Meridian 1 Option 21E

Equipment required

Table 10-1 lists minimum hardware requirements needed for a card level upgrade of an NT8D11 module to a Meridian 1 Option 21E.

Table 10-1
Minimum hardware requirements for a Meridian 1 Option 21E

Quantity			
AC system	DC system	Part Number	Description
1	1	NT9D33AA	Small System Multi-Drive Unit (SMDU)
1	1	NT9D34AA	Enhanced Multi-Drive System Interface (EMSI)
1	1	NT9D47AB	EMSI to SMDU Data Cable, 2 ft (610mm)
	1	or NT9D47AD	EMSI to SMDU Data Cable, 6 ft (1830mm)
1	1	NT9D66AB	EMSI to SMDU Power Cable, 2 ft (610mm)
1	1	or NT9D66AD	EMSI to SMDU Power Cable, 6 ft (1830mm)
1	1	NTND01CA	12MB CPU/Memory Card
1	1	NTND02BA Rls 2	Misc, Dual SDI Peripheral Signaling Pack with Battery (MSPS)
1	1	NTND31AA Rls 3	Daughter board (ROM)

Note: The vintages shown on circuit cards in Table 10-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

Summary of steps to upgrade

Upgrading consists of:

- removal of CPU, MMPS, FDI and FDU
- installation of Option 21E cards and cables
- sysload

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

Removal of CPU, MMPS , FDI and FDU

To remove cards:

- 1 Remove software disks from the Floppy Disk Unit.
- 2 Disconnect the cable from the faceplate of the FDI and FDU.
- 3 Set the ENB/DIS switches on cards located in slots 1, 2 and 3 to DIS.
- 4 Remove the Floppy Disk Unit and cards located in slots 1, 2 and 3.
- 5 Remove the NTND01 CPU/Memory card.

Installation of Option 21E equipment

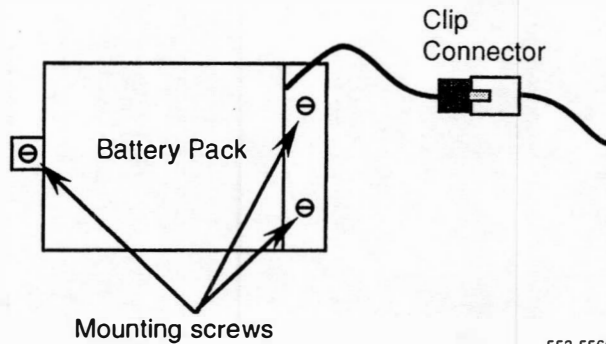
To install Option 21E cards and cables:

- 1 Set the ENB/DIS switch on the NT9D34 EMSI card to DIS.
- 2 Mount the appropriate software cartridge on the EMSI card and set option switches 1, 5, 7 and 8 to ON.
- 3 Install EMSI card in card slot 3 and set the ENB/DIS switch to ENB.
- 4 Install the NTND31AA ROM card onto the NTND01 CA CPU/Memory card:
 - Carefully plug the ROM card into the pin connector.
 - Install the screw and washer at each corner of the ROM card.
- 5 Install the CPU/Memory card in card slot 2.
- 6 Set the ENB/DIS switch on the MSPS card to DIS.
- 7 Set option switches on the MSPS card to activate SDI ports. To avoid conflicting addresses, determine the appropriate option switch settings, refer to *Circuit card installation and testing* (553-3001-211).

- 8 Connect the battery pack on the NTND02BA MSPS card by plugging the battery clip connector to the clip connector on the board as illustrated in Figure 10-1.

Note: The battery will not be fully charged until 24 hours after installation in a powered system.

Figure 10-1
Battery pack connection to the MSPS



-
- 9 Install the NTND02BA MSPS card in slot 3.
 - 10 Connect the NTND37 Dual SDI cable to the connector on the NTND02BA MSPS faceplate.
 - 11 Set the ENB/DIS switch on the NTND02BA MSPS card to ENB.
 - 12 Install the NT9D33 SMDU in its assigned position in the CE shelf. The SMDU may be installed in an alternate location such as the old network shelf in position 6 or any available PE slots, provided the NT9D47 and NT9D66 interface cables will reach from the SMDU to the EMSI.

Sysload

Before you sysload the system, review installation steps and verify that all circuit cards are in the appropriate card slots, ENB/DIS switches are set to ENB, and all cables are properly connected.

- 1 To sysload the system insert the floppy disks into disk drives and press Rld on the CPU/MEM card.
- 2 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Upgrading to
Option 51

SL-1 QCA6 cabinet upgrade to Meridian 1 Option 51

This procedure is used to upgrade an SL-1 QCA6 cabinet (L or LE) to Meridian 1 Option 51. To upgrade to a Meridian 1 Option 51 system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 51 is operating with the new software provided with the Option 51.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Modular Upgrade of an SL-1QCA6 cabinet (L or LE) to Meridian 1 Option 51

Equipment required

Table 11-1 lists minimum hardware requirements needed to upgrade a QCA6 cabinet to a DC powered Meridian 1 Option 51 system.

Table 11-1

Minimum hardware requirements for a DC Meridian 1 Option 51

Quantity	Part number	Description
1	NT6D39DC	CPU/Network Module DC
1	NT6D41AB	CE Power Supply DC
1	NT7D00BA	Top Cap DC
1	NT7D09CA	Pedestal DC
1	NT7D10CA	System Monitor Panel Assembly
1	NT7D67CA	Power Distribution Unit and filter assembly
1	NT8D17EA	Extended Conference/TDS Card
1	NT8D22AC	System Monitor
1	NT8D41AA	2 Port SDI Paddle Board
1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	NT8D46BH	System Monitor to MDF Cable
1	NT8D52DD	Pedestal Blower Unit DC
1	NT8D78AA	CPU Cable
1	NT8D80AB	MSI to MDU Cable, 2 ft (610 mm)
1	NTND08AA	ROM Card
1	NTND09CA	12 MB Memory Card
1	NTND10AA	Changeover & Memory Arbitrator Card
1	NTND16AA	4MB Multi Disk Unit (MDU)
1	QPC43R	Peripheral Signaling Card
-continued-		

Table 11-1 (continued)
Minimum hardware requirements for a DC Meridian 1 Option 51

Quantity	Part number	Description
1	NT8D84AA	XSDI to I/O panel Cable
1	NT8D93AJ	XSDI to TTY cable, 16 ft (4875 mm)
1	QPC84Q	Power Monitor
1	QPC441F	3 Port Extender Card
1	QPC579	CPU Function Card
1	QPC580C	CPU Interface Card
1	QPC584L	Mass Storage Interface Card
1	QPC477A-09	Bus Terminating Unit
1	QPC477A-10	Bus Terminating Unit
1	QPC477B-22	Bus Terminating Unit

Note: The vintages shown on circuit cards in Table 11-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA6 cabinets were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 51 Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 51 to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 51 to the existing cabinet.
- A second NT8D86 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Note: The second NT8D86 cable is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as a QCA7 or 8) do not require the second NT8D86 cable since the NT8D73 cable can be connected directly to the Peripheral Buffer card. For existing cabinets equipped to suppress EMI, refer to 553-3001-150, *Upgrade Engineering*.

Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 51 system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

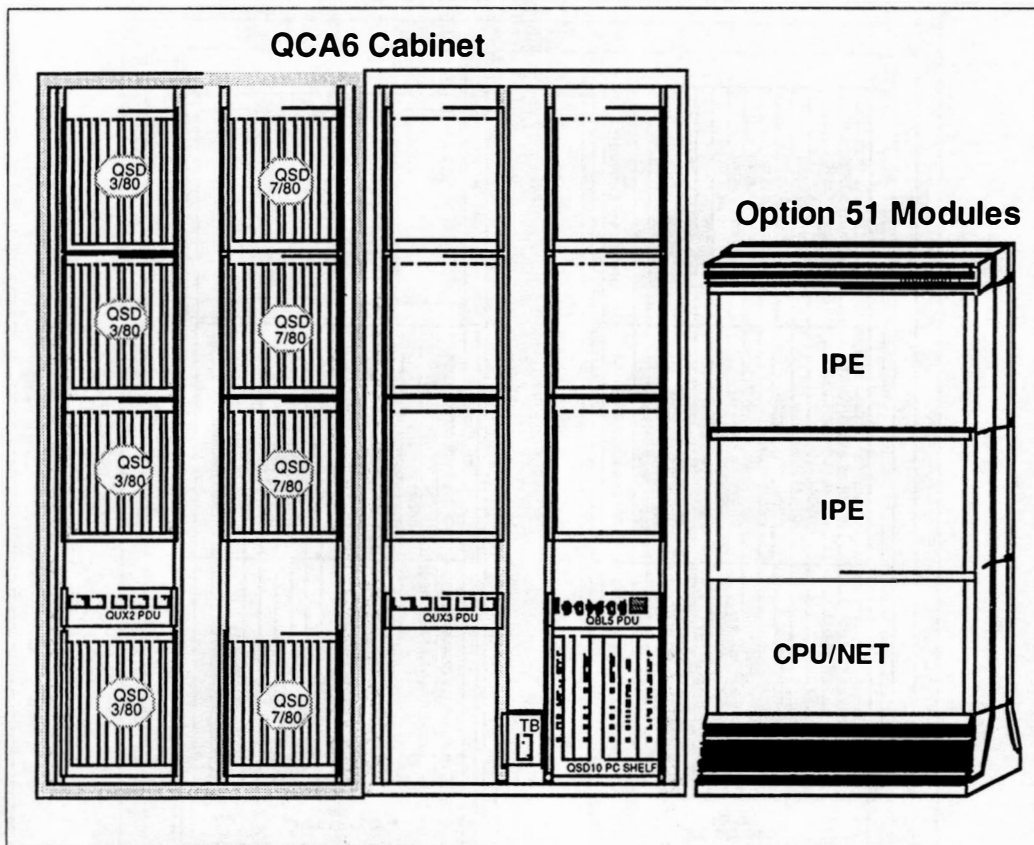
Figure 11-1 shows a typical QCA6 cabinet and Figure 11-2 shows a QCA6 cabinet that has been upgraded to Meridian 1 Option 51.

The diagram illustrates a server rack layout with two main sections. The top section features a cooling unit (QU01) on the left, followed by a power distribution unit (QU1) and three columns of server modules. The bottom section includes a power converter shelf (QU02) on the left, followed by another cooling unit (QU01) and two columns of server modules. The server modules are labeled with their respective functions, such as bus extenders, sequencers, ROMs, memory modules, and converters. The layout is organized to show the physical arrangement and connectivity of the hardware components.

Row	Section	Module Label
Top Row	Cooling Unit	QU01
		QU01
	Power Distribution Unit	QU1
		QU1
	Server Modules	QPC46 BUS EXTENDER 0
		QPC46 BUS EXTENDER 1
		QPC40 ALU
		QPC41 MISC
		QPC42 SEQUENCER
		QPC32 ROM
Bottom Row	Cooling Unit	QU01
		QU01
	Power Converter Shelf	QU02
		QU02
	Server Modules	QPC85 5/12V CONVERTER
		QPC52 NETWORK EXTENDER
		QPC43 PER SIG
		QPC50 NETWORK
		QPC50 NETWORK
		QPC50 NETWORK
Right Section	Tape Unit	QU1
		QU1
	Server Modules	QPC46 BUS EXTENDER 0
		QPC46 BUS EXTENDER 1
		QPC40 ALU
		QPC41 MISC
		QPC42 SEQUENCER
		QPC32 ROM
		QPC30 R/W MEMORY
		QPC30 R/W MEMORY
Bottom Row	Cooling Unit	QU01
		QU01
	Power Converter Shelf	QU02
		QU02
	Server Modules	QPC85 5/12V CONVERTER
		QPC52 NETWORK EXTENDER
		QPC43 PER SIG
		QPC50 NETWORK
		QPC50 NETWORK
		QPC50 NETWORK

Figure 11-2

Typical QCA6 cabinet that has been upgraded to Meridian 1 Option 51



Installing the Meridian 1 Option 51 system

The Option 51 equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, CPU/Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 51 equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 11-2 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.
 - Install cabling:
 - Cable common equipment
 - Cable network loops (within the Option 51 columns only).
- Note:** Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.
- Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 51 equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 11-3 shows Option 51 circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 11-2**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 11-2 (continued)**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 11-2 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves				Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."					
For each slave, indicates the slave address				Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."					
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master			on					
	slave			off					
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

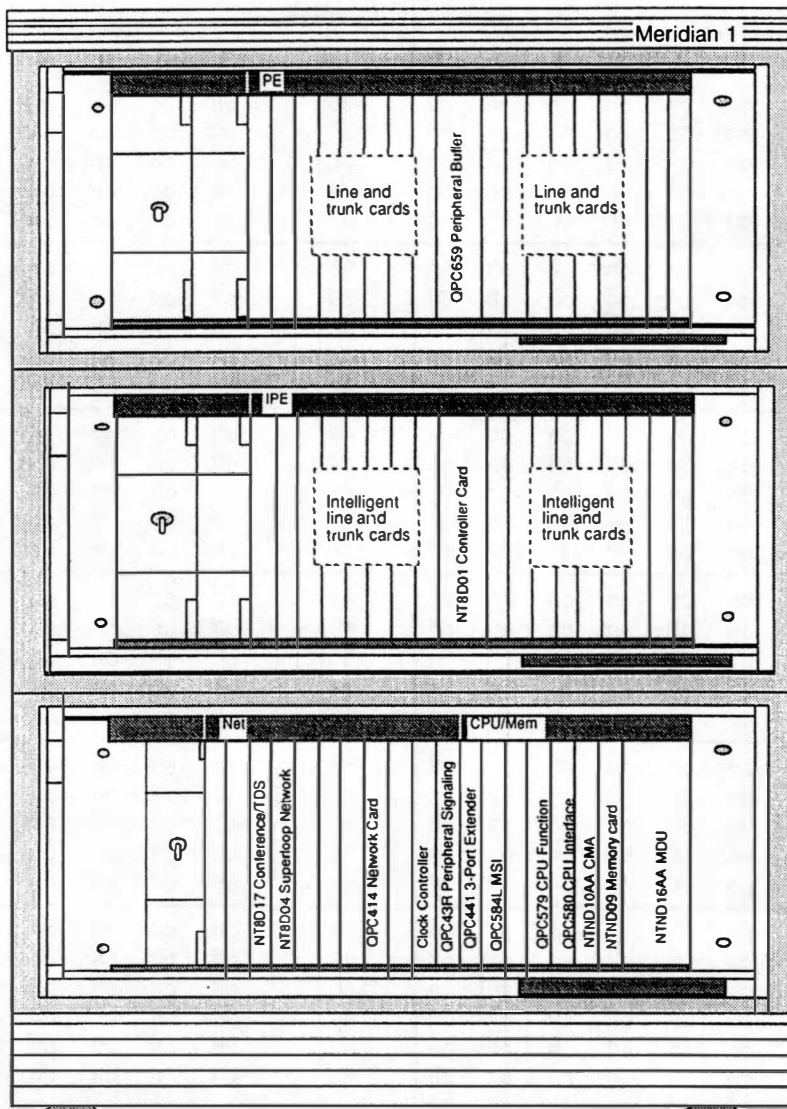
Table 11-2 (continued)
NT8D22 system monitor — settings for total number of slaves — SW2 on master

How many slave units		Switch position						How many slave units		Switch position					
		3	4	5	6	7	8			3	4	5	6	7	8
0		on	on	on	on	on	on	32		off	on	on	on	on	on
1		on	on	on	on	on	off	33		off	on	on	on	on	off
2		on	on	on	on	off	on	34		off	on	on	on	off	on
3		on	on	on	on	off	off	35		off	on	on	on	off	off
4		on	on	on	off	on	on	36		off	on	on	off	on	on
5		on	on	on	off	on	off	37		off	on	on	off	on	off
6		on	on	on	off	off	on	38		off	on	on	off	off	on
7		on	on	on	off	off	off	39		off	on	on	off	off	off
8		on	on	off	on	on	on	40		off	on	off	on	on	on
9		on	on	off	on	on	off	41		off	on	off	on	on	off
10		on	on	off	on	off	on	42		off	on	off	on	off	on
11		on	on	off	on	off	off	43		off	on	off	on	off	off
12		on	on	off	off	on	on	44		off	on	off	off	on	on
13		on	on	off	off	on	off	45		off	on	off	off	on	off
14		on	on	off	off	off	on	46		off	on	off	off	off	on
15		on	on	off	off	off	off	47		off	on	off	off	off	off
16		on	off	on	on	on	on	48		off	off	on	on	on	on
17		on	off	on	on	on	off	49		off	off	on	on	on	off
18		on	off	on	on	off	on	50		off	off	on	on	off	on
19		on	off	on	on	off	off	51		off	off	on	on	off	off
20		on	off	on	off	on	on	52		off	off	on	off	on	on
21		on	off	on	off	on	off	53		off	off	on	off	on	off
22		on	off	on	off	off	on	54		off	off	on	off	off	on
23		on	off	on	off	off	off	55		off	off	on	off	off	off
24		on	off	off	on	on	on	56		off	off	off	on	on	on
25		on	off	off	on	on	off	57		off	off	off	on	on	off
26		on	off	off	on	off	on	58		off	off	off	on	off	on
27		on	off	off	on	off	off	59		off	off	off	on	off	off
28		on	off	off	off	on	on	60		off	off	off	off	on	on
29		on	off	off	off	on	off	61		off	off	off	off	on	off
30		on	off	off	off	off	on	62		off	off	off	off	off	on
31		on	off	off	off	off	off	63		off	off	off	off	off	off
— continued —															

Table 11-2 (continued)
NT8D22 system monitor — slave address — SW2 on slave

Slave unit address							Position							Slave unit address							Position						
	3	4	5	6	7	8									3	4	5	6	7	8							
1	on	on	on	on	on	off	33	off	on	on	on	on	off	33	off	on	on	on	on	off							
2	on	on	on	on	off	on	34	off	on	on	on	off	on	34	off	on	on	on	off	on							
3	on	on	on	on	off	off	35	off	on	on	on	off	off	35	off	on	on	on	off	off							
4	on	on	on	off	on	on	36	off	on	on	off	on	on	36	off	on	on	off	on	on							
5	on	on	on	off	on	off	37	off	on	on	off	on	off	37	off	on	on	off	on	off							
6	on	on	on	off	off	on	38	off	on	on	off	off	on	38	off	on	on	off	off	on							
7	on	on	on	off	off	off	39	off	on	on	off	off	off	39	off	on	on	off	off	off							
8	on	on	off	on	on	on	40	off	on	off	on	on	on	40	off	on	off	on	on	on							
9	on	on	off	on	on	off	41	off	on	off	on	on	off	41	off	on	off	on	on	off							
10	on	on	off	on	off	on	42	off	on	off	on	off	on	42	off	on	off	on	off	on							
11	on	on	off	on	off	off	43	off	on	off	on	off	off	43	off	on	off	on	off	off							
12	on	on	off	off	on	on	44	off	on	off	off	on	on	44	off	on	off	off	on	on							
13	on	on	off	off	on	off	45	off	on	off	off	on	off	45	off	on	off	off	on	off							
14	on	on	off	off	off	on	46	off	on	off	off	off	on	46	off	on	off	off	off	on							
15	on	on	off	off	off	off	47	off	on	off	off	off	off	47	off	on	off	off	off	off							
16	on	off	on	on	on	on	48	off	off	on	on	on	on	48	off	off	on	on	on	on							
17	on	off	on	on	on	off	49	off	off	on	on	on	off	49	off	off	on	on	on	off							
18	on	off	on	on	off	on	50	off	off	on	on	off	on	50	off	off	on	on	off	on							
19	on	off	on	on	off	off	51	off	off	on	on	off	off	51	off	off	on	on	off	off							
20	on	off	on	off	on	on	52	off	off	on	off	on	on	52	off	off	on	off	on	on							
21	on	off	on	off	on	off	53	off	off	on	off	on	off	53	off	off	on	off	on	off							
22	on	off	on	off	off	on	54	off	off	on	off	off	on	54	off	off	on	off	off	on							
23	on	off	on	off	off	off	55	off	off	on	off	off	off	55	off	off	on	off	off	off							
24	on	off	off	on	on	on	56	off	off	off	on	on	on	56	off	off	off	on	on	on							
25	on	off	off	on	on	off	57	off	off	off	on	on	off	57	off	off	off	on	on	off							
26	on	off	off	on	off	on	58	off	off	off	on	off	on	58	off	off	off	on	off	on							
27	on	off	off	on	off	off	59	off	off	off	on	off	off	59	off	off	off	on	off	off							
28	on	off	off	off	on	on	60	off	off	off	off	on	on	60	off	off	off	off	on	on							
29	on	off	off	off	on	off	61	off	off	off	off	on	off	61	off	off	off	off	on	off							
30	on	off	off	off	off	on	62	off	off	off	off	off	on	62	off	off	off	off	off	on							
31	on	off	off	off	off	off	63	off	off	off	off	off		63	off	off	off	off	off								
32	off	on	on	on	on	on																					

Figure 11-3
Meridian 1 Option 51 CPU/Network and IPE modules



Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 51: one designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 51, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Note: Depending on the power configuration used it may be required to do modifications to the existing cabinets. If modifications are required, do them as part of the cut-over procedures (described later in this document) to avoid unnecessary interruption of service to the end users.

Connect the DC power to the Option 51 columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 51 equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 51 module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 51 modules.

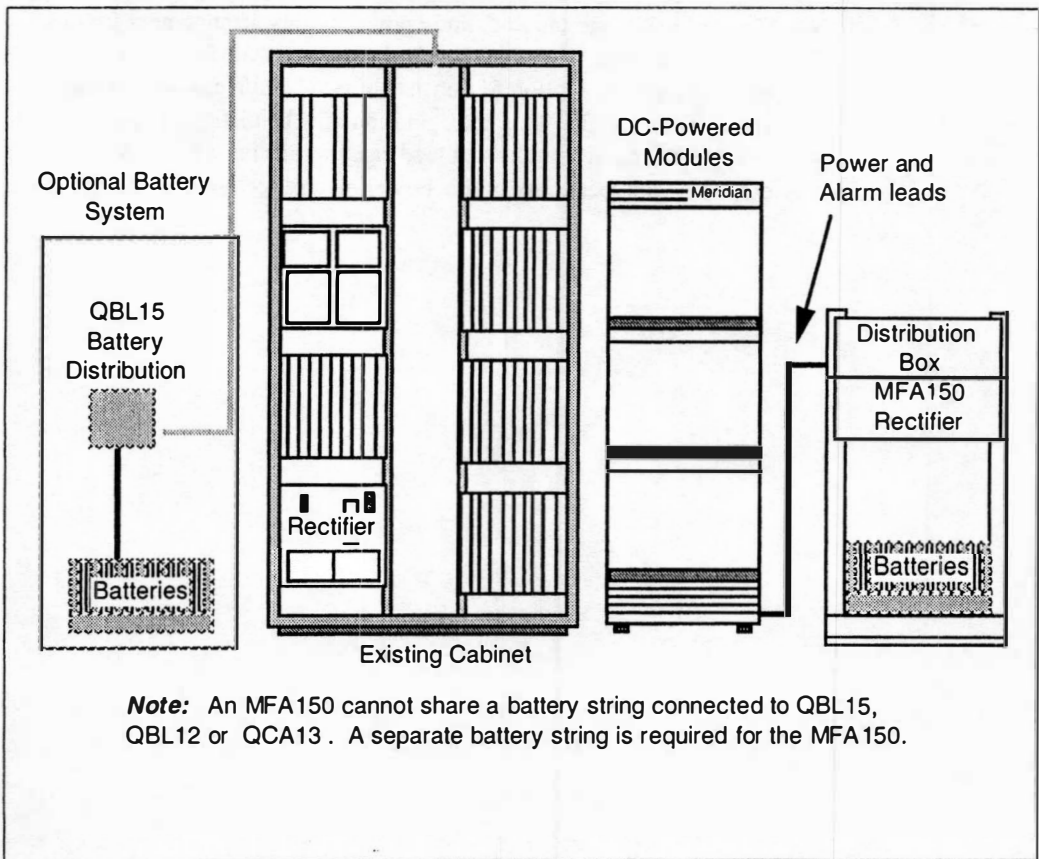
- a new power source installed in conjunction with the Option 51.

To determine the power requirements for the Option 51 system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade engineering*.

Separate power source

Figure 11-4 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 51 modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 51 column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

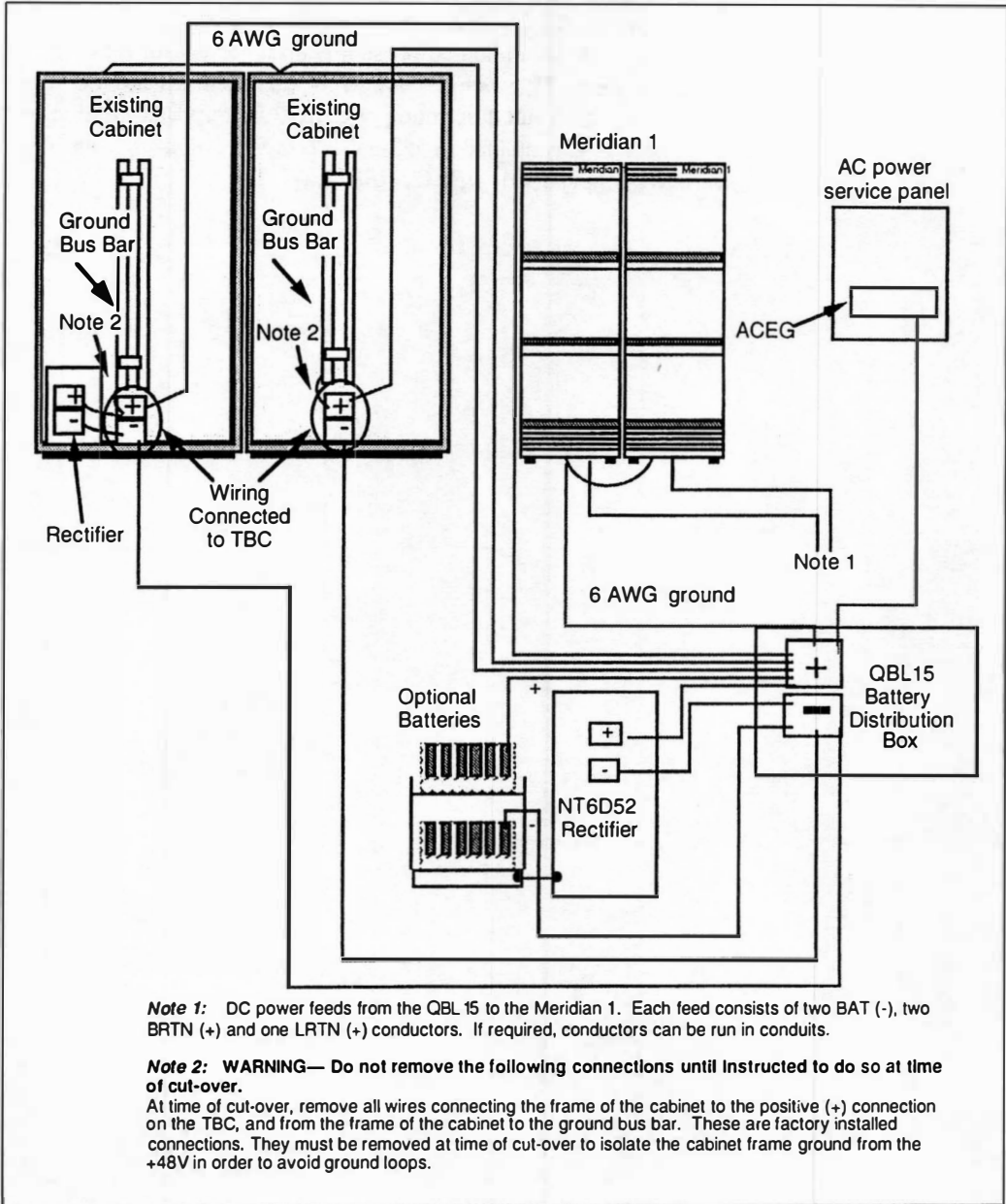
Figure 11-4
Typical arrangement of independently DC-powered Meridian 1 Option 51 modules



Common power source

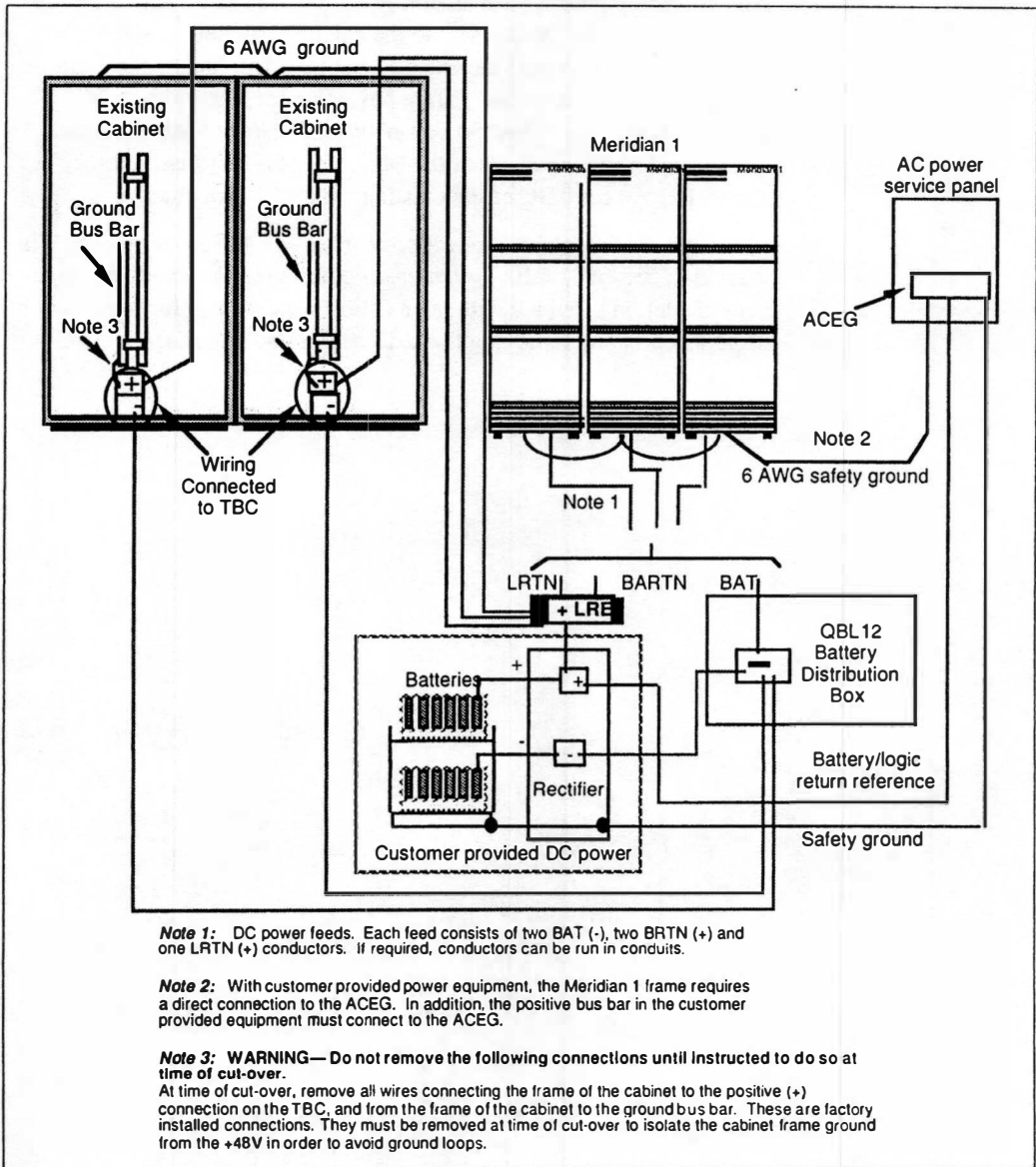
Existing cabinet rectifier as a common power source

- When the existing cabinet DC power source is used as a common power source for the cabinet and the column, any QSD4 rectifier will have to be replaced with a QRF8 rectifier and the existing battery distribution box will have to be replaced with a QBL15 battery distribution box. For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 11-5 illustrates a common power supply arrangement for the upgraded system. This includes both Option 51 modules and the existing cabinet. Option 51 consists of two CPU/Network modules and an IPE module. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

Figure 11-5**Typical arrangement using a common DC power supply with optional battery backup**

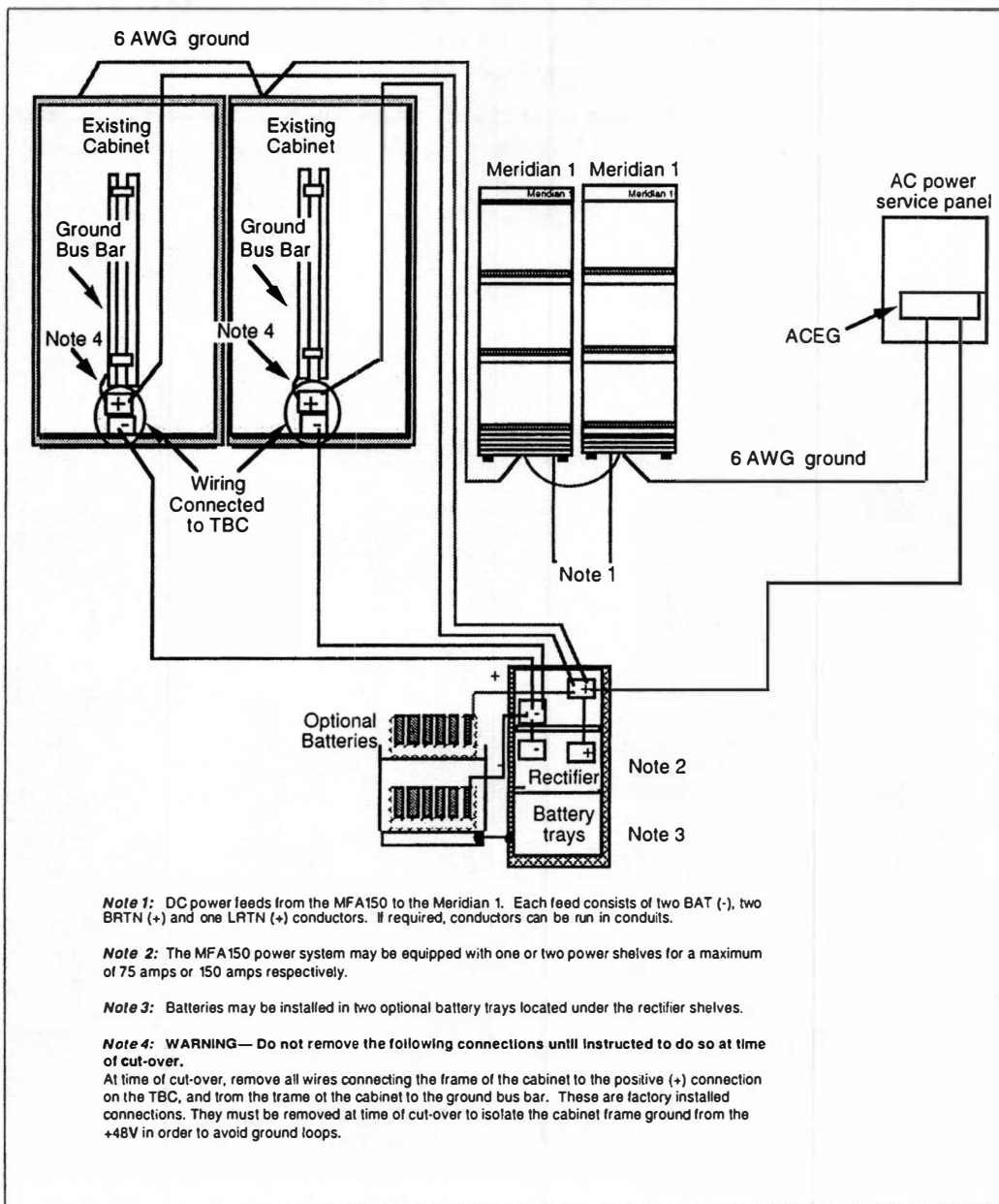
Customer provided power as a common power source

- A QBL12 Battery Distribution Box is normally used to connect to a customer provided DC power source. Figure 11-6 illustrates a customer provided common power supply arrangement for the upgraded system. This includes both Option 51 modules and the existing cabinet. A full description of QBL12 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 11-6**Typical arrangement using a customer provided common DC power supply**

An MFA150 power system as a common power source

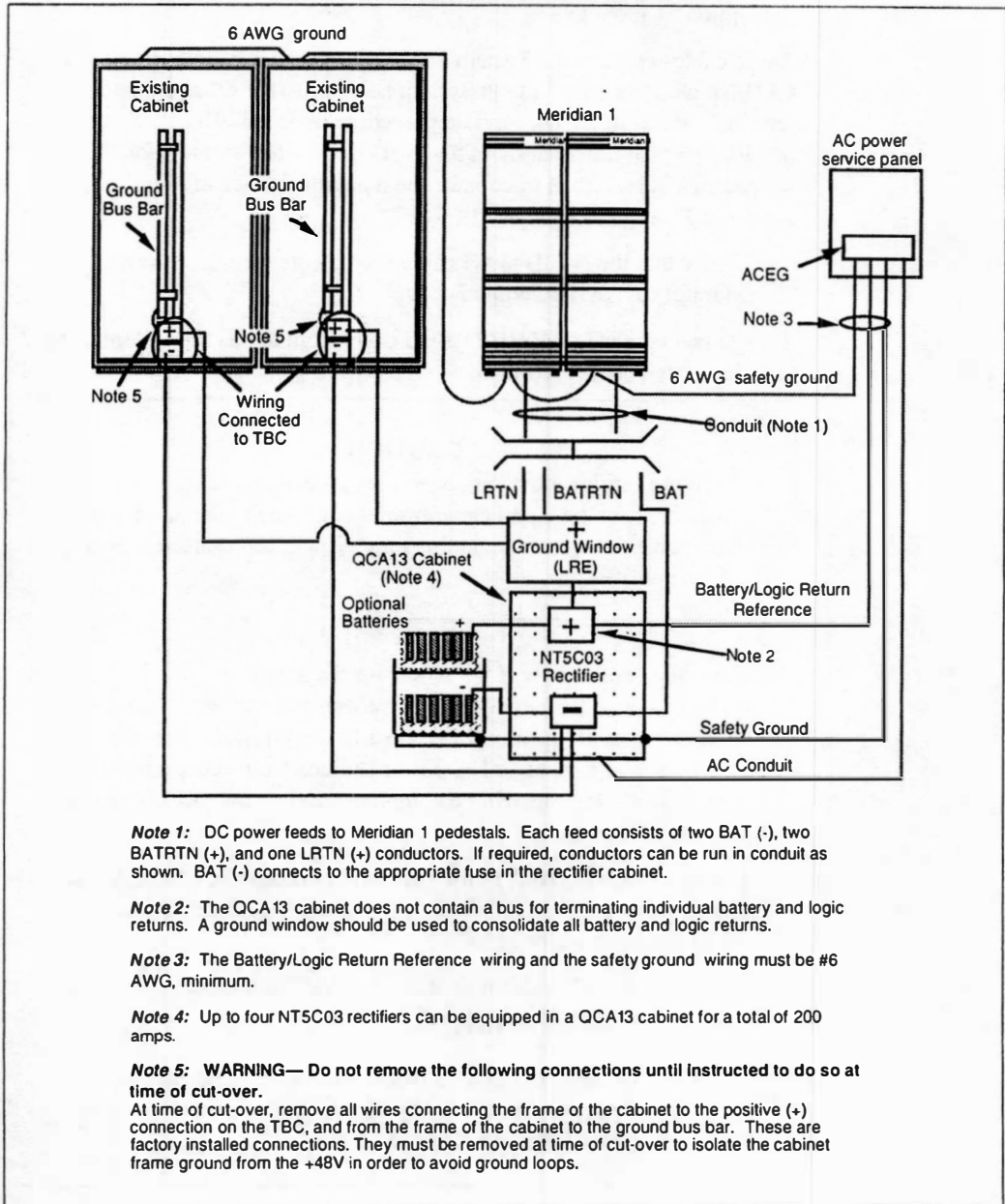
- An MFA150 power system assembly can be used as a common power source for both the Option 51 and the existing cabinets as shown in Figure 11-7. To connect the existing cabinets, disconnect the + and - 48V power leads from the existing power source, then reroute and connect them to the MFA150 power system. The connections are located under the top cover of the MFA150 power system. The connections at the TBC of the existing cabinet do not change.
- More information about connections for the MFA150 power system is located in 553-3001-210, *System installation procedures*. Refer to the documentation provided with the existing system for information about disconnecting and removing the old rectifier and batteries.

Figure 11-7**Typical arrangement using an MFA150 power system as a common power source**

An existing QCA 13 power cabinet as a common power source

- A QCA 13 power cabinet equipped with rectifiers can be used as a common power source for both the Option 21E and the existing cabinets as shown in Figure 11-8.
- For information about connections for the QCA13 power cabinet, refer to 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 11-8
Typical arrangement using a QCA13 as a common power source



Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 51 modules.

These cables connect the System Monitor to the SDI Paddle Board in the CPU/Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section '**Separate power source**' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/SB/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 11-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 51 system:

- 1 Power up and initially load the Option 51 column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.

- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.

- 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:

- Configure network loops to match loop types and loop numbers of the existing system configuration.
- Configure I/O devices as in the existing system.
- Reenter customer data blocks. System options and features must be set as in the existing system.
- Configure station data blocks.
- Configure route data blocks.
- Configure trunk data blocks.
- Configure remaining system configuration records.
- Verify system operation before adding new equipment.
- Configure new equipment and functions, if any.

- 4 The Meridian 1 Option 51 system is now operational.
-

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 51 column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 Connect an NT8D86 cable between the connector on the faceplate of the network card and the I/O panel of the Option 51. One cable is required for each network loop.
- 2 Connect an NT8D73 shielded cable, up to 30 ft (9 m) in length, to the connector on the I/O panel of the Option 51. Route the NT8D73 cable to the existing cabinet. Do not connect it to the Peripheral Buffer card in the existing cabinet at this time.

Note: Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

- 3 If required in the existing cabinet (see Note) connect an NT8D86 cable to the connector on the NT8D73 shielded cable from the Option 51. Make sure that the connectors are locked together with the locking devices. Do not connect the cable to the faceplate of the Peripheral Buffer card at this time. It will be connected as part of the cutover procedure.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable. The NT8D73 shielded cable can be connected directly to the connector of the Peripheral Buffer card.

—OR—

If the existing cabinet is equipped to suppress EMI, the NT8D73 shielded cable should be connected to its assigned filter connector. See 553-3001-150, *Upgrade Engineering* for more information.

Cutting-over

The following procedure describes how to cut-over to the Option 51 system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL12 or QCA13 unit**
Remove the fuses from the -48V fuse panel corresponding to each cabinet and column.
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.

Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.

- **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.

- 2 If required, perform power modifications to the existing cabinets.
- 3 In the existing cabinets, remove the wiring connecting the frame of the cabinet to the positive (+) connection of the TBC, and the wiring connecting the frame to the cabinet ground bus bar. Refer to Figures 11-5 through 11-7.

Note: This wiring was factory installed. It must be removed to avoid ground loops when existing cabinets are used with Meridian 1 modules.

- 4 This step applies only to Meridian 1 modules connected to a DC power source.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 11-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
 - the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.
- 5 This step applies only if a new common power source with battery backup connected to a QBL12, QBL15 or QCA13 battery distribution box is to be used.

Note: This step does not apply if the common power source uses an MFA150 power system.

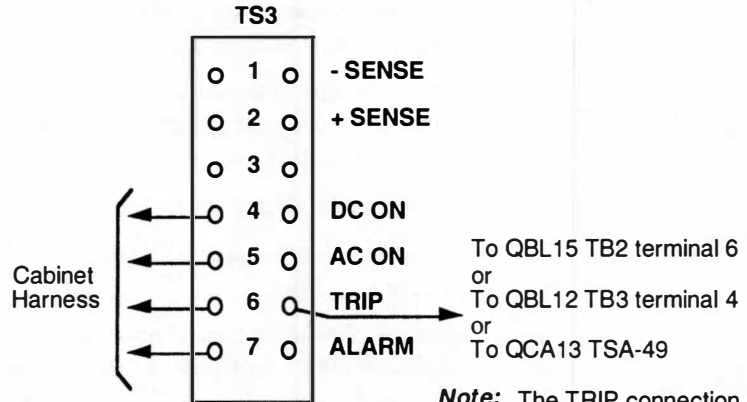
A TRIP lead must be connected to the TRIP connection on:

- the TRIP terminal on the terminal strip on the rectifier in existing cabinets equipped with a rectifier.
- the TRIP terminal of TS3 in existing cabinets not equipped with a rectifier.

The TRIP leads must be connected as follows.

If the existing rectifier is being removed from the cabinet, make the following wiring changes.

- a) If not already connected to TS3, tag and move the cabinet harness DC ON, AC ON, TRIP and ALARM leads presently connected on the rectifier to TS3 as shown in the above drawing. Depending on the type of existing cabinet, the TS3 is located either on the cabinet's TBC block, or on the QUT3 power unit.



Note: The TRIP connection is not required with an MFA150

- b) Install and connect a 16 AWG wire from terminal 6 (TRIP) on TS3 to the TRIP connection in the QBL12, QBL15 or QCA13 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connections in each cabinet with 16 AWG wire.
- c) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.

Note: The DC ON, AC ON and ALARM lead functions are performed by the Meridian 1 module. Leaving these leads connected in the existing cabinets only extends the alarm indicators to the QPC84 power monitors. If you wish, you may leave these leads disconnected. However, the TRIP lead must be connected.

If the existing rectifier is to remain in the cabinet, make the following wiring changes.

- a) Install and connect a 16 AWG wire from the TRIP connection on the terminal strip of the rectifier to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connection on the terminal strip of the rectifier in each cabinet with 16 AWG wire. In existing cabinets not equipped with a rectifier (such as a QCA7 cabinet powered by a QCA8 cabinet), 'daisy chain' to the TRIP connection on TS3.
 - b) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.
- 6 Cross-connect the alarm cables as shown in Figure 11-10.
 - 7 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.
 - 8 Connect the NT8D86 cables (if provided) or NT8D73 shielded network cables from the Option 51 to the connector on the faceplate of the Peripheral Buffer circuit card in the existing cabinets.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable. The NT8D73 shielded cable can be connected directly to the connector on the faceplate of the Peripheral Buffer card.

—OR—

If the existing cabinet is equipped to suppress EMI, the NT8D73 shielded cable should be connected to its assigned filter connector. See 553-3001-150, *Upgrade Engineering* for more information.

- 9 Remove the QPC84 Power Monitor from the QCA6 cabinet and set switch C11, position 2 to ON. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required. Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.

Note: Disregard any remaining alarm indications. Alarm indications should return to normal once the upgrade is completed and equipment that is no longer required has been removed as described later in this chapter.

- 10 Restore power to the cabinets and column by reinserting the removed fuse and resetting all circuit breakers to ON.

CAUTION

Do not remove the NT8D22 system monitor (XSM) from the column while the system is in service. Removing the XSM may cause the input circuit breakers on the existing cabinets to trip.

- 11 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.
-

Figure 11-9
NT8D46 cable types

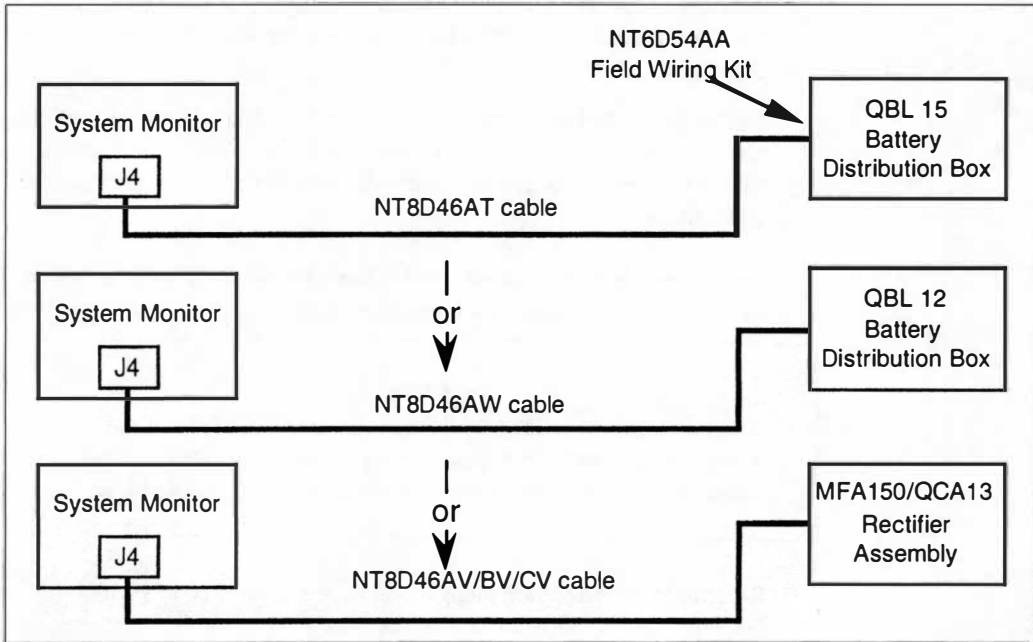
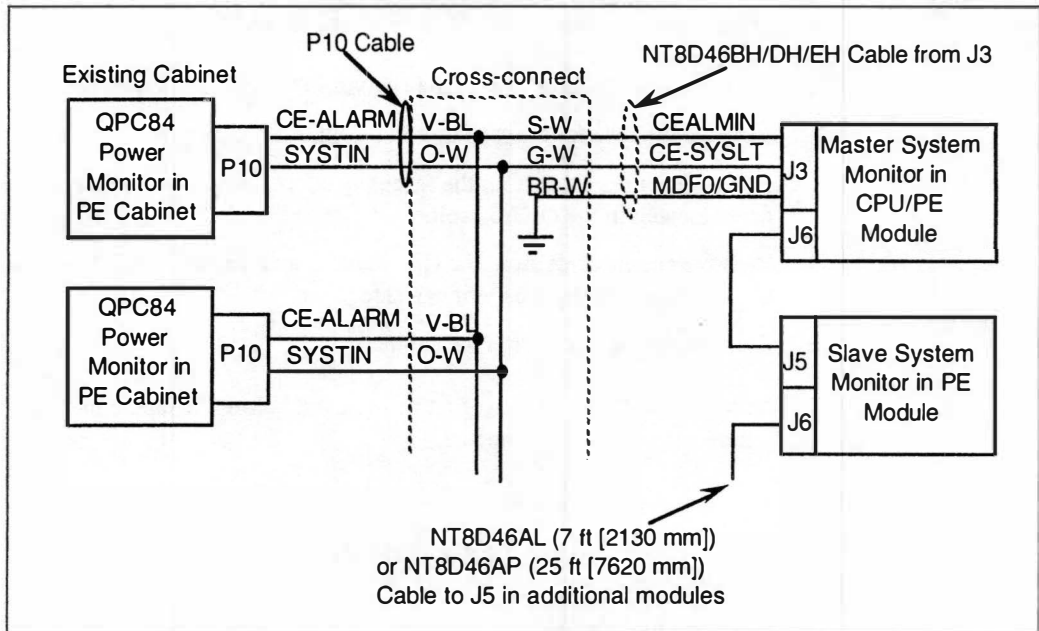


Figure 11-10
Connecting alarm cables between a cabinet and a column



Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

Removing equipment no longer required

The following procedure describes how to remove the equipment that is no longer required once the Option 51 is operating normally.

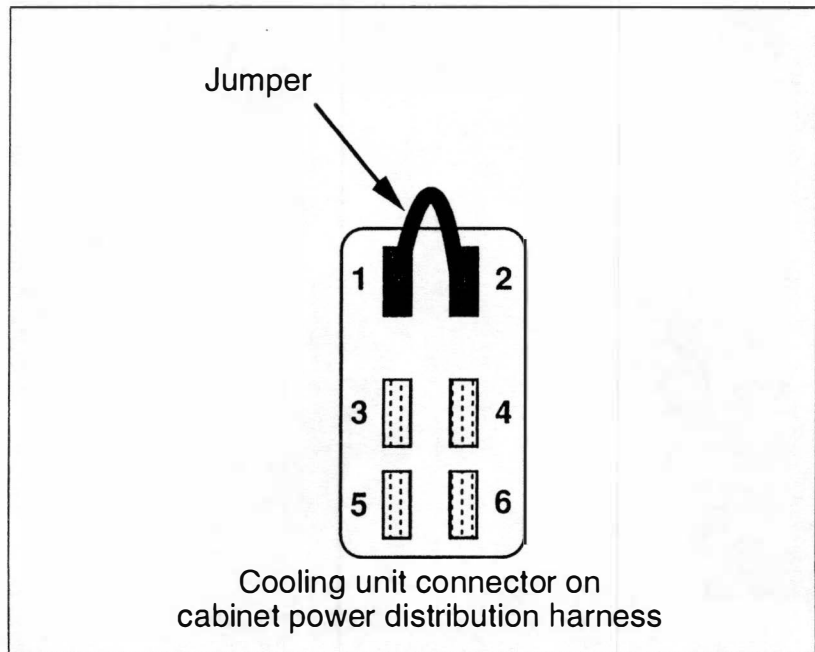
- 1 Set the circuit breakers for all the shelves in the QCA6 cabinet to OFF.
- 2 Remove the fuse for the tape unit in the QCA6 cabinet.
- 3 Disconnect the cables from the faceplate connectors on all the circuit cards located in the QCA6 cabinet.
- 4 Remove circuit cards from the CE, network and memory shelves in the QCA6 cabinet and store them in a safe place.
- 5 Remove the tape unit from the cabinet.

Note: The tape unit must first be removed before the tape unit connector can be disconnected.

- 6 Disconnect power and alarm connections:
 - Disconnect all alarm connectors from the harness to the CPU/MEM shelf.
 - Unplug the power converter card and all common equipment circuit cards from each CPU/MEM shelf.
 - Disconnect power connections and the power monitor connector from the cabinet power distribution harness on the backplane of each CPU/MEM shelf.
- 7 If you are using Network shelves for DTI/PRI cards:
 - Install the DTI/PRI cards in Network shelf card slots 1, 3, 5, 7, 9, and 11.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the CPU/Network module of the Option 51 upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breakers for the Network shelves to ON.
- 8 If you are not going to use Network shelves for DTI/PRI cards:
 - Disconnect the alarm connector from the harness to each Network shelf.

- Unplug the power converter card from each Network shelf.
- Disconnect power connections and the power monitor connector from the cabinet power distribution harness on the backplane on each Network shelf.
- Tape all exposed power leads with electrical insulation tape
- Disconnect and remove the QUDI cooling units. Place a jumper (a piece of 24 or 26 AWG bare wire or a paper clip can be used) across power monitor leads 1 and 2 of the cooling unit power connector as shown in Figure 11-11. This disables the alarm for the removed cooling unit.

Figure 11-11
Cooling unit alarm connection



SL-1 QCA23 cabinet upgrade to Meridian 1 Option 51

This procedure is used to upgrade an SL-1 QCA23 cabinet (LE, N, NT, ST, 21 or 21E) to a Meridian 1 Option 51. To upgrade to a Meridian 1 Option 51 system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51:

1) **In-house software conversion**

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) **Manual data entry**

With this method, the database is re-entered manually once the Option 51 is operating with the new software provided with the Option 51.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Modular upgrade of an SL-1 QCA23 cabinet (LE, N, NT, ST, 21 or 21E) to Meridian 1 Option 51

Equipment required

Table 12-2 lists minimum hardware requirements needed to upgrade a QCA23 cabinet to a DC powered Meridian 1 Option 51.

Table 12-2

Minimum hardware requirements for a DC Meridian 1 Option 51

Quantity	Part number	Description
1	NT6D39DC	CPU/Network Module DC
1	NT6D41AB	CE Power Supply DC
1	NT7D00BA	Top Cap DC
1	NT7D09CA	Pedestal DC
1	NT7D10CA	System Monitor Panel Assembly
1	NT7D67CA	Power Distribution Unit and filter assembly
1	NT8D17EA	Extended Conference/TDS Card
1	NT8D22AC	System Monitor
1	NT8D41AA	2 Port SDI Paddle Board
1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	NT8D46BH	System Monitor to MDF Cable
1	NT8D52DD	Pedestal Blower Unit DC
1	NT8D78AA	CPU Cable
1	NT8D80AB	MSI to MDU Cable, 2 ft (610 mm)
1	NTND08AA	ROM Card
1	NTND09CA	12 MB Memory Card
1	NTND10AA	Changeover & Memory Arbitrator Card
1	NTND16AA	4MB Multi Disk Unit (MDU)
1	QPC43R	Peripheral Signaling Card
-continued-		

Table 12-2 (continued)
Minimum hardware requirements for a DC Meridian 1 Option 51

Quantity	Part number	Description
1	NT8D84AA	XSDI to I/O panel Cable
1	NT8D93AJ	XSDI to TTY cable, 16 ft (4875 mm)
1	QPC84Q	Power Monitor
1	QPC441F	3 Port Extender Card
1	QPC579	CPU Function Card
1	QPC580C	CPU Interface Card
1	QPC584L	Mass Storage Interface Card
1	QPC477A-09	Bus Terminating Unit
1	QPC477A-10	Bus Terminating Unit
1	QPC477B-22	Bus Terminating Unit

Note: The vintages shown on circuit cards in Table 12-2 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA23 cabinets were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 51 Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 51 to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 51 to the existing cabinet.
- A second NT8D86 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Note: The second NT8D86 cable is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as a QCA7 or 8) do not require the second NT8D86 cable since the NT8D73 cable can be connected directly to the Peripheral Buffer connector. For existing cabinets equipped to suppress EMI, refer to 553-3001-150, *Upgrade Engineering*.

Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 51 system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 12-1 shows a typical QCA23 cabinet and Figure 12-2 shows a QCA23 cabinet that has been upgraded to Meridian 1 Option 51.

Figure 12-1
Typical QCA23 cabinet

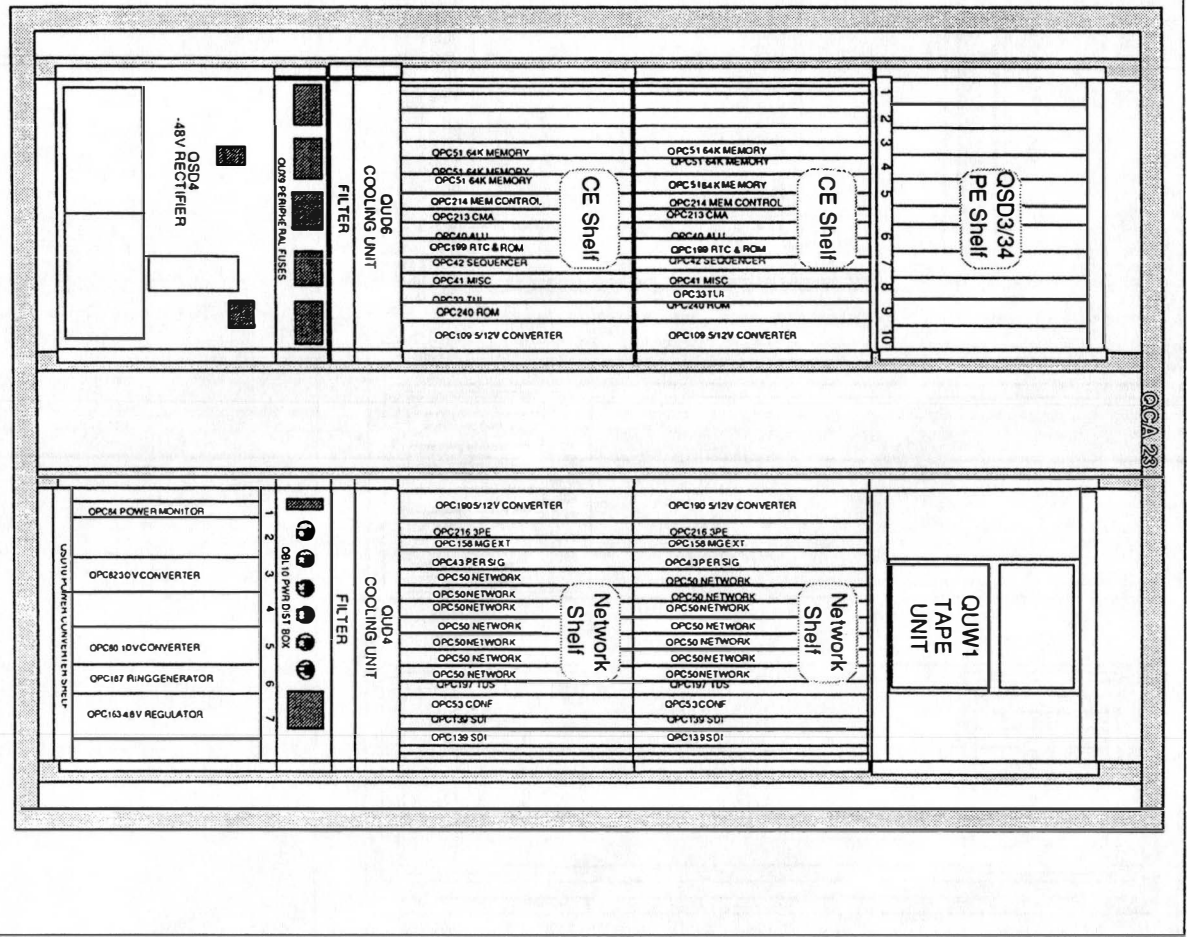
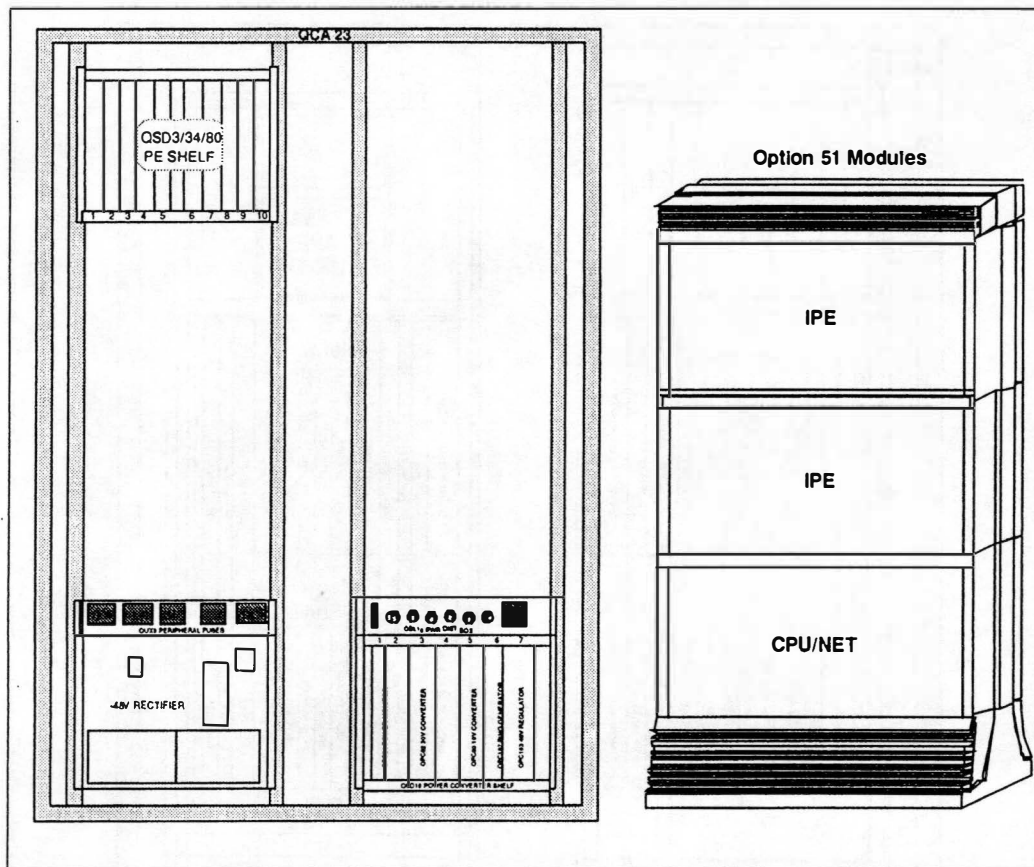


Figure 12-2

Typical QCA23 cabinet that has been upgraded to Meridian 1 Option 51



Installing the Meridian 1 Option 51 system

The Option 51 equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, CPU/Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 51 equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 12-3 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.
- Install cabling:
 - Cable common equipment
 - Cable network loops (within the Option 51 columns only).

Note: Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.

- Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 51 equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 12-3 shows Option 51 circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 12-3**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 12-3 (continued)**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 12-3 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves		Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."							
For each slave, indicates the slave address		Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."							
SW3 indication		Position							
		1	2	3	4				
CTA	master	on off							
	slave								
CTR	master		on off						
	slave								
FAIL	master					on off			
	slave								
MAJOR	master								on off
	slave								
— continued —									

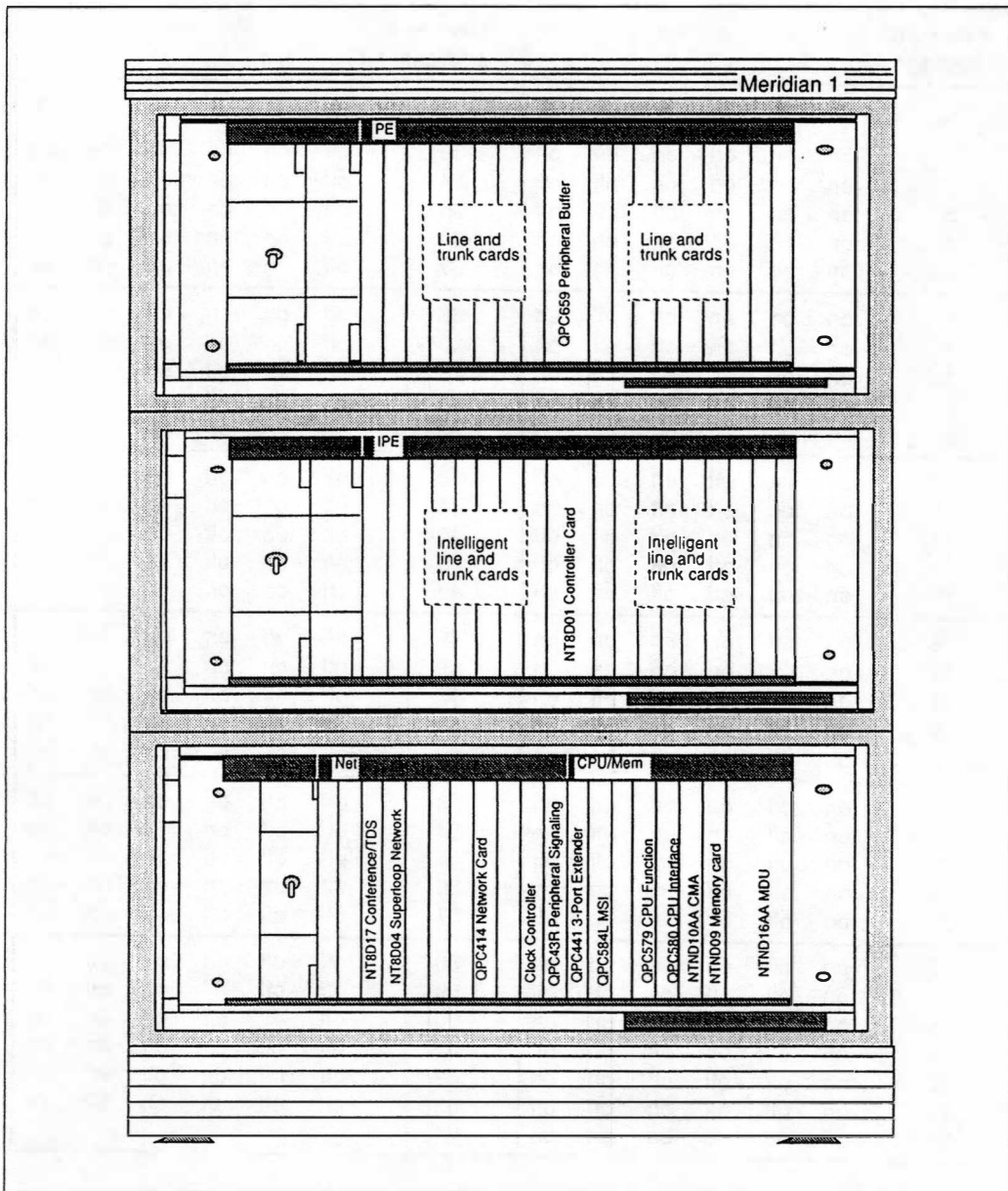
Table 12-3 (continued)
NT8D22 system monitor — settings for total number of slaves — SW2 on master

How many slave units	Switch position						How many slave units	Switch position					
	3	4	5	6	7	8		3	4	5	6	7	8
0	on	on	on	on	on	on	32	off	on	on	on	on	on
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
— continued —													

Table 12-3 (continued)
NT8D22 system monitor — slave address — SW2 on slave

Slave unit address							Position						
	3	4	5	6	7	8		3	4	5	6	7	8
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
32	off	on	on	on	on	on							

Figure 12-3
Meridian 1 Option 51 CPU/Network and IPE modules



Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 51: one that is designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 51, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Note: Depending on the power configuration used it may be required to do modifications to the existing cabinets. If modifications are required, do them as part of the cut-over procedures (described later in this document) to avoid unnecessary interruption of service to the end users.

Connect the DC power to the Option 51 columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 51 equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 51 module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 51 modules.

- a new power source installed in conjunction with the Option 51.

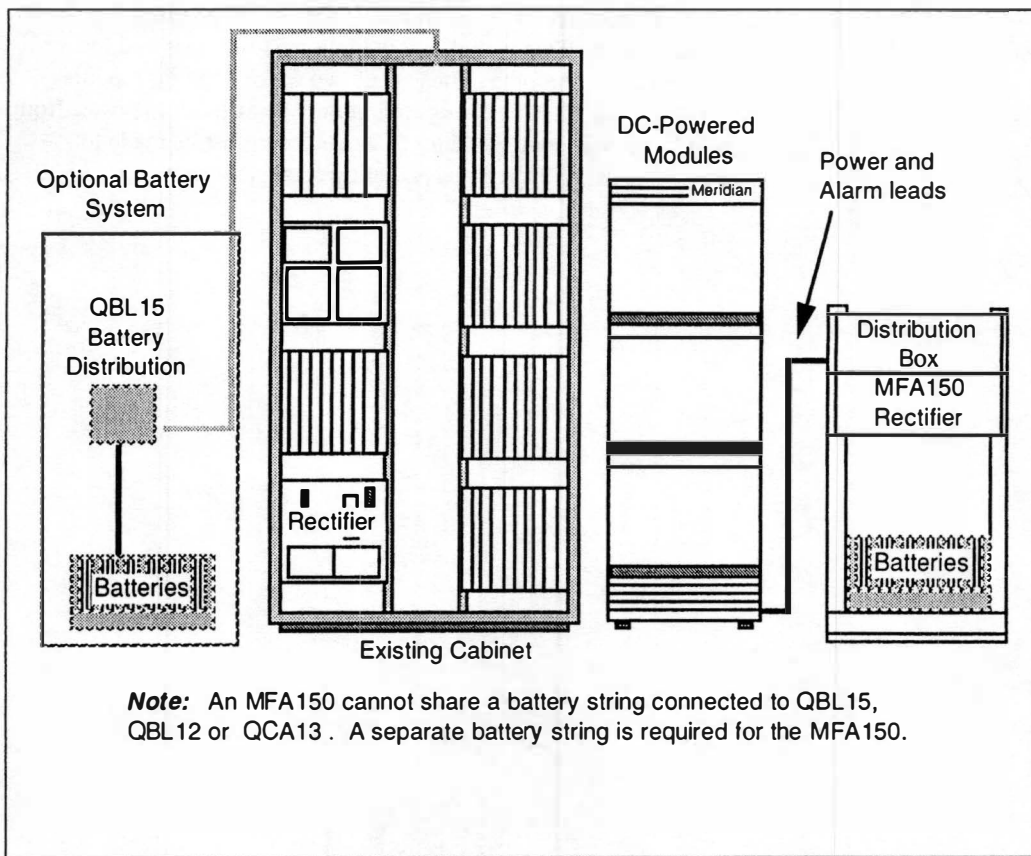
To determine the power requirements for the Option 51 system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 12-4 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 51 modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 51 column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 12-4

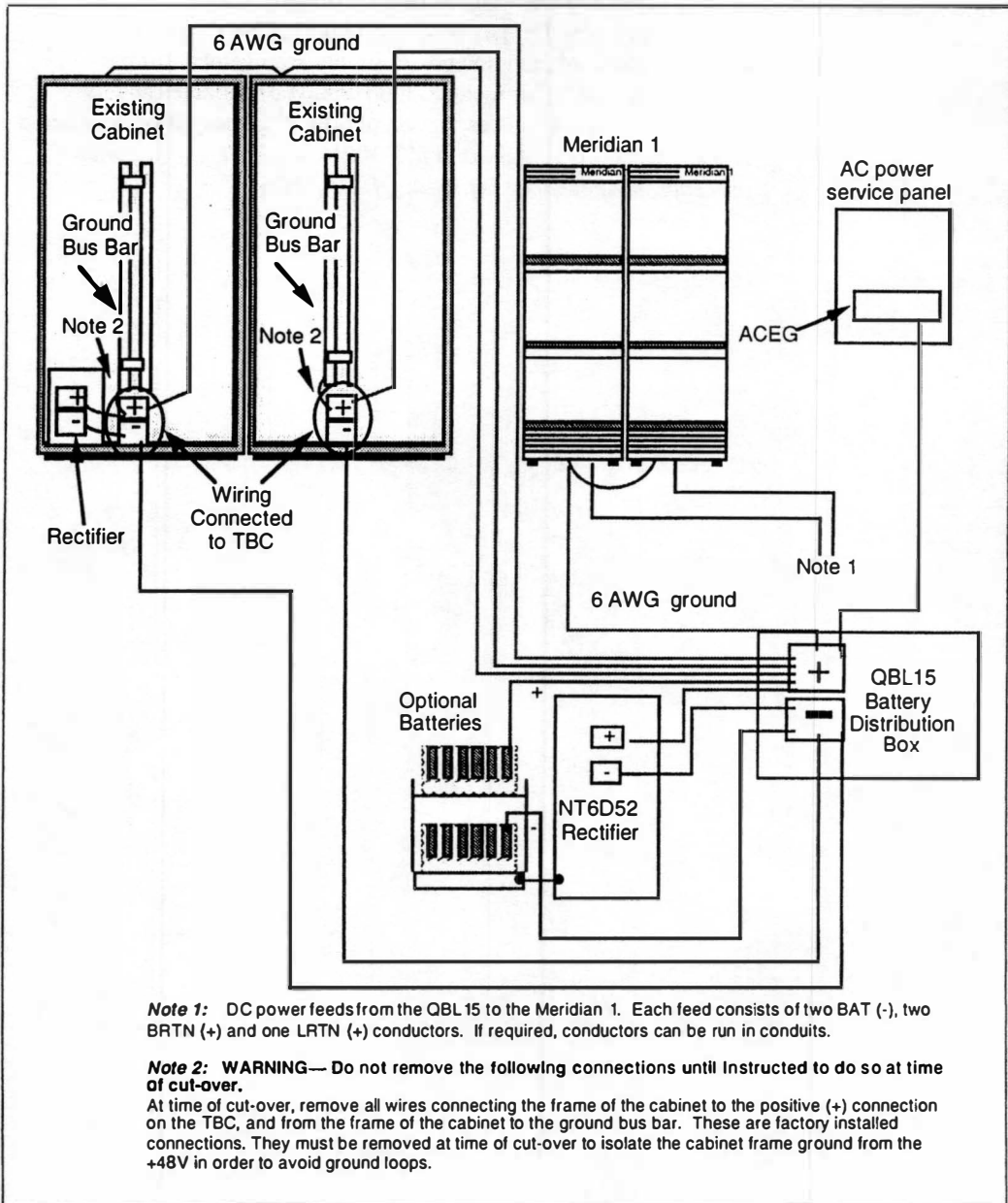
Typical arrangement of independently DC-powered Meridian 1 Option 51 modules



Common power source

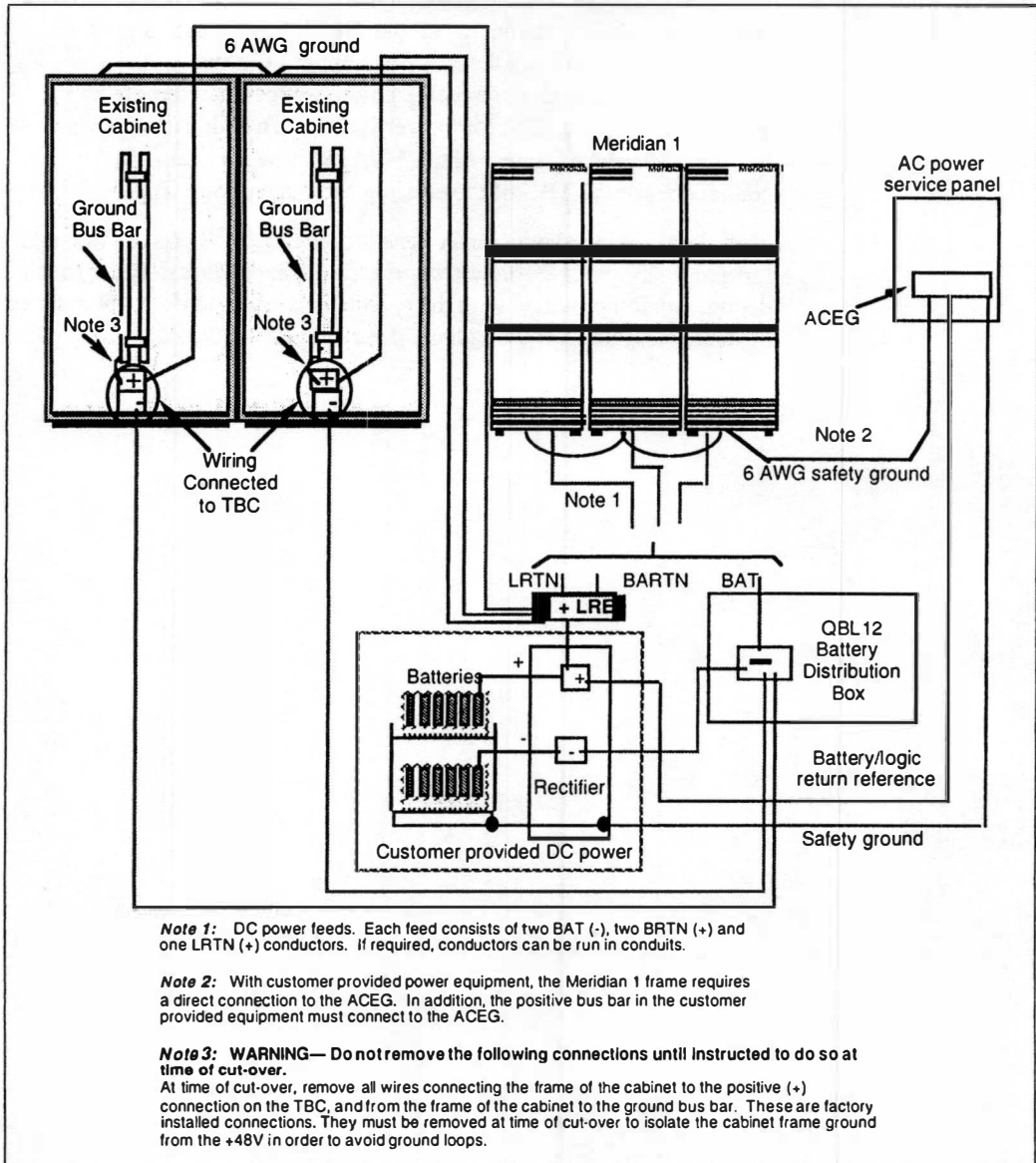
Existing cabinet rectifier as a common power source

- When the existing cabinet DC power source is used as a common power source for the cabinet and the column, any QSD4 rectifier will have to be replaced with a QRF8 rectifier and the existing battery distribution box will have to be replaced with a QBL15 battery distribution box. For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 12-5 illustrates a common power supply arrangement for the upgraded system. This includes both Option 51 modules and the existing cabinet. Option 51 consists of two CPU/Network modules and an IPE module. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

Figure 12-5**Typical arrangement using a common DC power supply with optional battery backup**

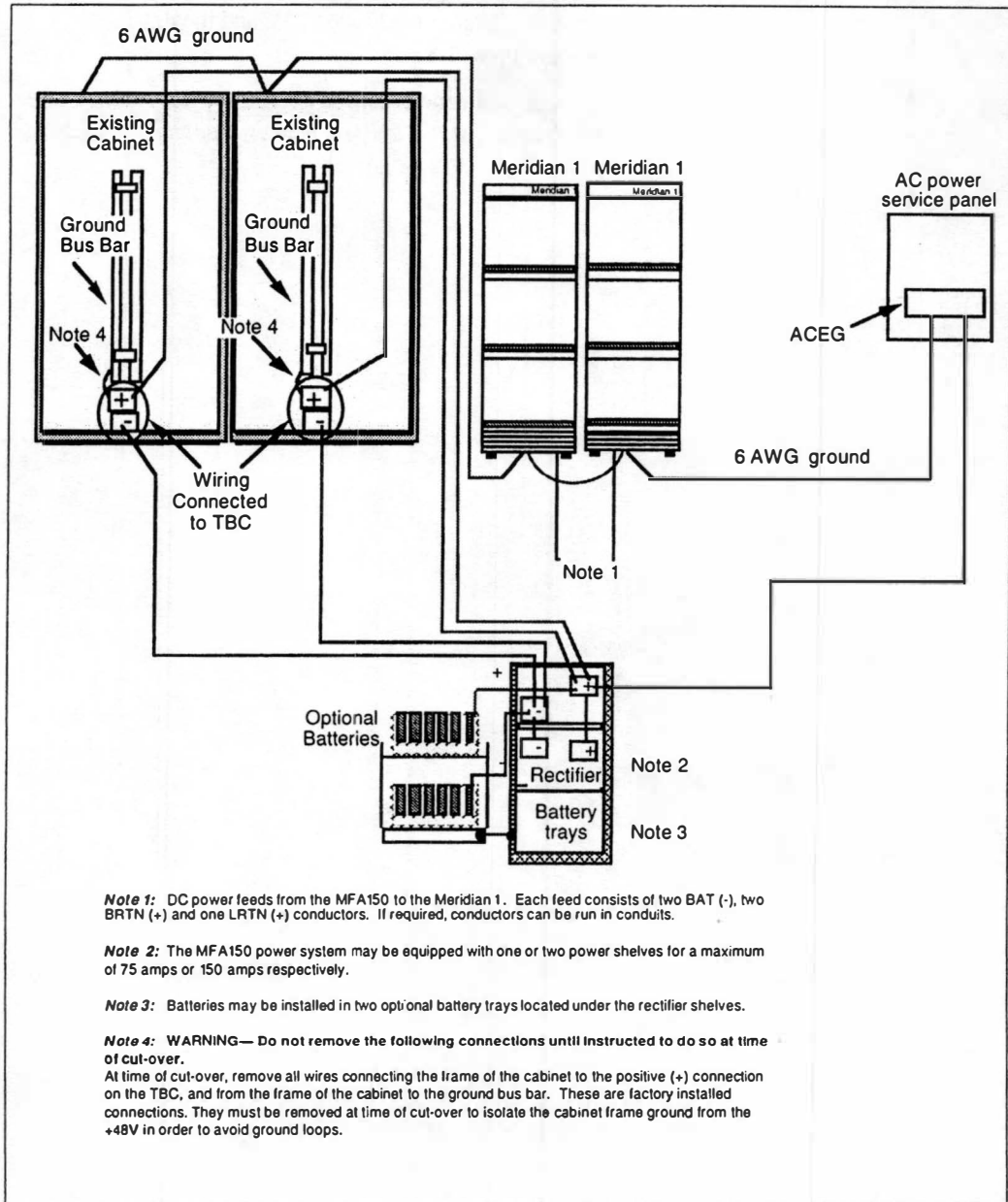
Customer provided power as a common power source

- A QBL12 Battery Distribution Box is normally used to connect to a customer provided DC power source. Figure 12-6 illustrates a customer provided common power supply arrangement for the upgraded system. This includes both Option 51 modules and the existing cabinet. A full description of QBL12 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 12-6**Typical arrangement using a customer provided common DC power supply**

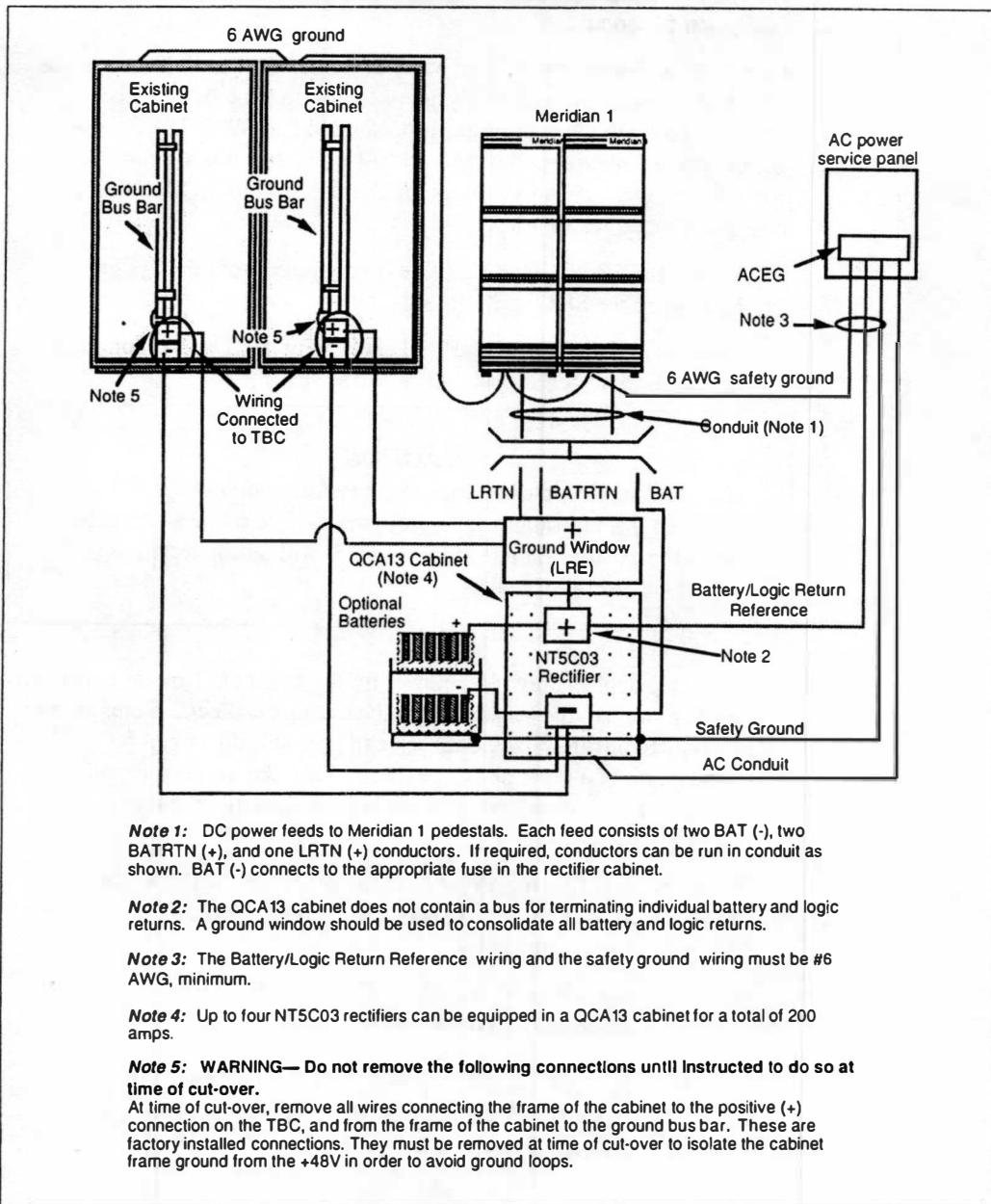
An MFA150 power system as a common power source

- An MFA150 power system assembly can be used as a common power source for both the Option 51 and the existing cabinets as shown in Figure 12-7. To connect the existing cabinets, disconnect the + and - 48V power leads from the existing power source, then reroute and connect them to the MFA150 power system. The connections are located under the top cover of the MFA150 power system. The connections at the TBC of the existing cabinet do not change.
- More information about connections for the MFA150 power system is located in 553-3001-210, *System installation procedures*. Refer to the documentation provided with the existing system for information about disconnecting and removing the old rectifier and batteries.

Figure 12-7**Typical arrangement using an MFA150 power system as a common power source**

An existing QCA13 power cabinet as a common power source

- A QCA13 power cabinet equipped with rectifiers can be used as a common power source for both the Option 21E and the existing cabinets as shown in Figure 1-8.
- For information about connections for the QCA13 power cabinet, refer to 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 12-8**Typical arrangement using a QCA13 as a common power source**

Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 51 modules.

These cables connect the System Monitor to the SDI Paddle Board in the CPU/Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section 'Separate power source' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 12-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 51 system:

- 1 Power up and initially load the Option 51 column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.

- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
 - 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
 - 4 The Meridian 1 Option 51 is now operational.
-

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 51 column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 Connect an NT8D86 cable between the connector on the faceplate of the network card and the I/O panel of the Option 51. One cable is required for each network loop.
- 2 Connect an NT8D73 shielded cable, up to 30 ft (9 m) in length, to the connector on the I/O panel of the Option 51. Route the NT8D73 cable to the existing cabinet. Do not connect it to the Peripheral Buffer card in the existing cabinet at this time.

Note: Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

- 3 If required in the existing cabinet (see Note) connect an NT8D86 cable to the connector on the NT8D73 shielded cable from the Option 51. Make sure that the connectors are locked together with the locking devices. Do not connect the cable to the faceplate of the Peripheral Buffer card at this time. It will be connected as part of the cutover procedure.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable.

Cutting-over

The following procedure describes how to cut-over to the Option 51 system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL12 or QCA13 unit**
Remove the fuses from the -48V fuse panel corresponding to each cabinet and column.
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.

Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.

- **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
- 2 If required, perform power modifications to the existing cabinets.
 - 3 In the existing cabinets, remove the wiring connecting the frame of the cabinet to the positive (+) connection of the TBC, and the wiring connecting the frame to the cabinet ground bus bar. Refer to Figures 12-5 through 12-7.

Note: This wiring was factory installed. It must be removed to avoid ground loops when existing cabinets are used with Meridian 1 modules.

- 4 This step applies only to Meridian 1 modules connected to a DC power source.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 2-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
- or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

- 5 This step applies only if a new common power source with battery backup connected to a QBL12 or QBL15 battery distribution box is to be used.

Note: This step does not apply if the common power source uses an MFA150 rectifier.

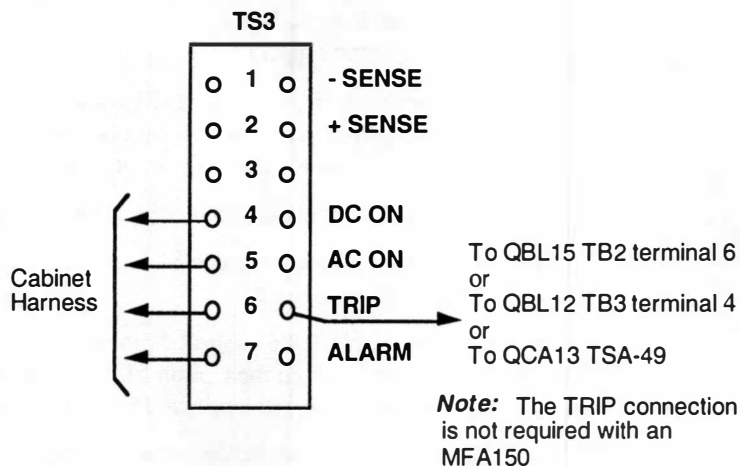
A TRIP lead must be connected to the TRIP connection on:

- the TRIP terminal on the terminal strip on the rectifier in existing cabinets equipped with a rectifier.
- the TRIP terminal of TS3 in existing cabinets not equipped with a rectifier.

The TRIP leads must be connected as follows.

If the existing rectifier is being removed from the cabinet, make the following wiring changes.

- a) If not already connected to TS3, tag and move the cabinet harness DC ON, AC ON, TRIP and ALARM leads presently connected on the rectifier to TS3 as shown in the above drawing. Depending on the type of existing cabinet, the TS3 is located either on the cabinet's TBC block, or on the QUT3 power unit.



- b) Install and connect a 16 AWG wire from terminal 6 (TRIP) on TS3 to the TRIP connection in the QBL12, QBL15 or QCA13 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connections in each cabinet with 16 AWG wire.
- c) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.

Note: The DC ON, AC ON and ALARM lead functions are performed by the Meridian 1 module. Leaving these leads connected in the existing cabinets only extends the alarm indicators to the QPC84 power monitors. If you wish, you may leave these leads disconnected. However, the TRIP lead must be connected.

If the existing rectifier is to remain in the cabinet, make the following wiring changes.

- a) Install and connect a 16 AWG wire from the TRIP connection on the terminal strip of the rectifier to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connection on the terminal strip of the rectifier in each cabinet with 16 AWG wire. In existing cabinets not equipped with a rectifier (such as a QCA7 cabinet powered by a QCA8 cabinet), 'daisy chain' to the TRIP connection on TS3.
 - b) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.
- 6 Cross-connect the alarm cables as shown in Figure 12-10.
 - 7 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.
 - 8 Connect the NT8D86 cables (if provided) or NT8D73 shielded network cables from the Option 51 to the connector on the faceplate of the Peripheral Buffer circuit card in the existing cabinets.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable. The NT8D73 shielded cable can be connected directly to the connector of the Peripheral Buffer card.

—OR—

If the existing cabinet is equipped to suppress EMI, the NT8D73 shielded cable should be connected to its assigned filter connector. See 553-3001-150, *Upgrade Engineering* for more information.

- 9 Remove the QPC84 Power Monitor from the QCA23 cabinet and set switch C11, position 2 to ON. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required. Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.

Note: Disregard any remaining alarm indications. Alarm indications should return to normal once the upgrade is completed and equipment that is no longer required has been removed as described later in this chapter.

- 10 Restore power to the cabinets and column by reinserting the removed fuse and resetting all circuit breakers to ON.

CAUTION

Do not remove the NT8D22 system monitor (XSM) from the column while the system is in service. Removing the XSM may cause the input circuit breakers on the existing cabinets to trip.

- 11 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.
-

Figure 12-9
NT8D46 cable types

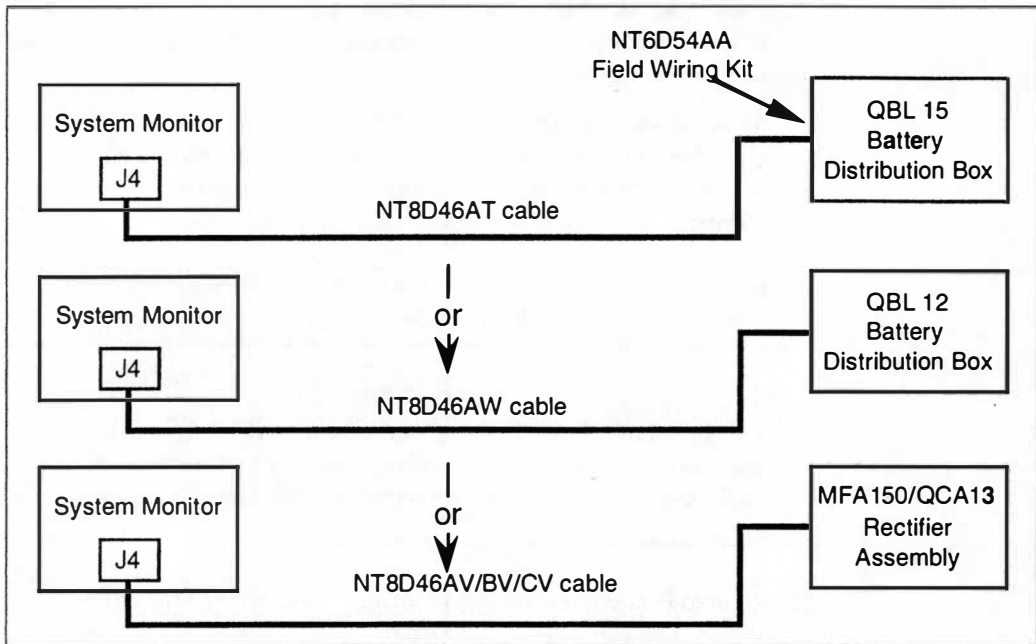
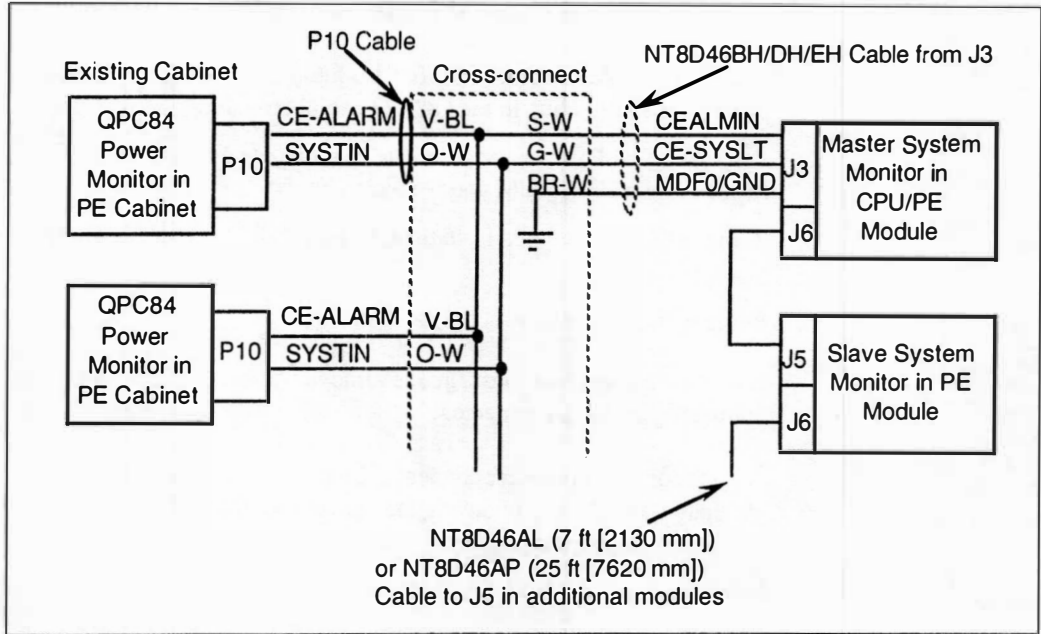


Figure 12-10
Connecting alarm cables between a cabinet and a column



Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

Removing equipment no longer required

The following procedure describes how to remove the equipment that is no longer required once the Option 51 is operating normally.

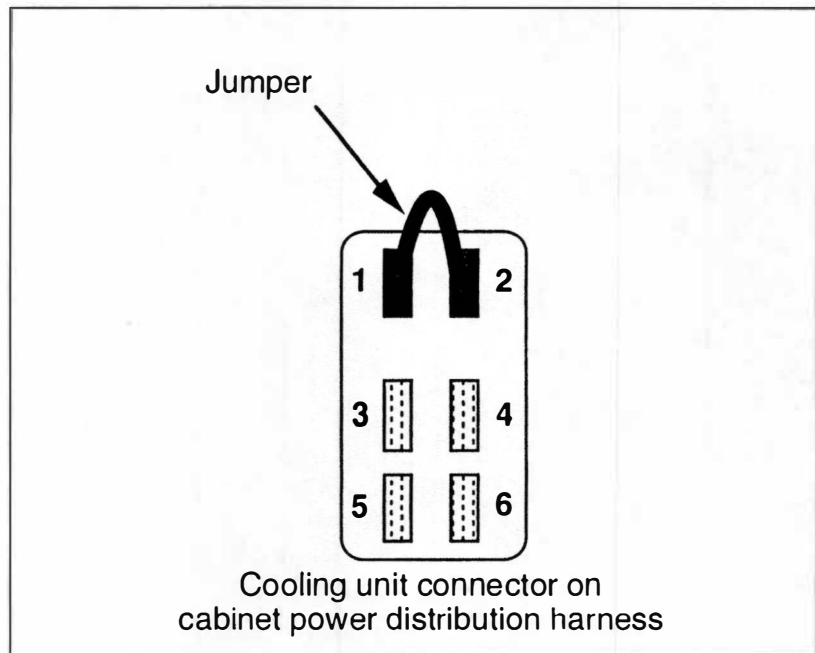
- 1 Set circuit breakers CPU0, NET0, CPU1 and NET1 on the QBL10 power distribution box in the QCA23 cabinet to OFF.
- 2 Disconnect cables from the faceplate connectors on circuit cards located in the CPU/MEM and Network shelves.
- 3 Remove CE circuit cards from the CE shelf and store them in a safe place.
- 4 Remove the tape unit from the cabinet.

Note: The tape unit must first be removed before the tape unit connector can be disconnected.

- Disconnect the power connector from the cabinet power wiring harness to the shelf housing the tape unit or QMM38 Mass Storage Unit, if equipped.
- 5 If you are using the main CE shelf for DTI/PRI cards:
 - Install the DTI/PRI cards in CE shelves.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the CPU/Network module of the Option 21E upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breakers CPU0, NET0, CPU1 and NET1 on the QBL10 power distribution box to ON.

- 6 If you are not going to use the CE shelf for DTI/PRI cards:
- Disconnect alarm connectors from the CE shelves.
 - Unplug all power converter cards the shelves.
 - Disconnect power connections and the power monitor connector from the cabinet power distribution harness to the backplane on QSD54 and QSD55 shelves.
 - Disconnect and remove the QUD4 and QUD6 cooling units. Place a jumper (a piece of 24 or 26 AWG bare wire or a paper clip can be used) across power monitor leads 1 and 2 of the cooling unit power connector as shown in Figure 12-11. This disables the alarm for the removed cooling unit.

Figure 12-11
Cooling unit alarm connection



SL-1 QCA28 cabinet upgrade to Meridian 1 Option 51

This procedure is used to upgrade an SL-1 QCA28 cabinet (A, ST, 21 or 21E) to Meridian 1 Option 51. To upgrade to a Meridian 1 Option 51 system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 51 is operating with the new software provided with the Option 51.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Modular upgrade of an SL-1 QCA28 cabinet (A, ST, 21 or 21E) to Meridian 1 Option 51

Equipment required

Table 13-1 lists minimum hardware requirements needed to upgrade to a DC powered Meridian 1 Option 51 system.

Table 13-1

Minimum hardware requirements for a DC Meridian 1 Option 51

Quantity	Part number	Description
1	NT6D39DC	CPU/Network Module DC
1	NT6D41AB	CE Power Supply DC
1	NT7D00BA	Top Cap DC
1	NT7D09CA	Pedestal DC
1	NT7D10CA	System Monitor Panel Assembly
1	NT7D67CA	Power Distribution Unit and filter assembly
1	NT8D17EA	Extended Conference/TDS Card
1	NT8D22AC	System Monitor
1	NT8D41AA	2 Port SDI Paddle Board
1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	NT8D46BH	System Monitor to MDF Cable
1	NT8D52DD	Pedestal Blower Unit DC
1	NT8D78AA	CPU Cable
1	NT8D80AB	MSI to MDU Cable, 2 ft (610 mm)
1	NTND08AA	ROM Card
1	NTND09CA	12 MB Memory Card
1	NTND10AA	Changeover & Memory Arbitrator Card
1	NTND16AA	4MB Multi Disk Unit (MDU)
1	QPC43R	Peripheral Signaling Card
-continued-		

Table 13-1 (continued)
Minimum hardware requirements for a DC Meridian 1 Option 51

Quantity	Part number	Description
1	NT8D84AA	XSDI to I/O panel Cable
1	NT8D93AJ	XSDI to TTY cable, 16 ft (4875 mm)
1	QPC84Q	Power Monitor
1	QPC441F	3 Port Extender Card
1	QPC579	CPU Function Card
1	QPC580C	CPU Interface Card
1	QPC584L	Mass Storage Interface Card
1	QPC477A-09	Bus Terminating Unit
1	QPC477A-10	Bus Terminating Unit
1	QPC477B-22	Bus Terminating Unit

Note: The vintages shown on circuit cards in Table 13-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA28 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 51 Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 51 to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 51 to the existing cabinet.
- A second NT8D86 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Note: The second NT8D86 cable is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as a QCA7 or 8) do not require the second NT8D86 cable since the NT8D73 cable can be connected directly to the Peripheral Buffer connector. For existing cabinets equipped to suppress EMI, refer to 553-3001-150, *Upgrade Engineering*.

Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

To upgrade to a Meridian 1 Option 51 system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 51 system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 13-1 shows a typical QCA28 cabinet and Figure 13-2 shows a QCA28 cabinet that has been upgraded to Meridian 1 Option 51.

Figure 13-1
Typical QCA28 cabinet

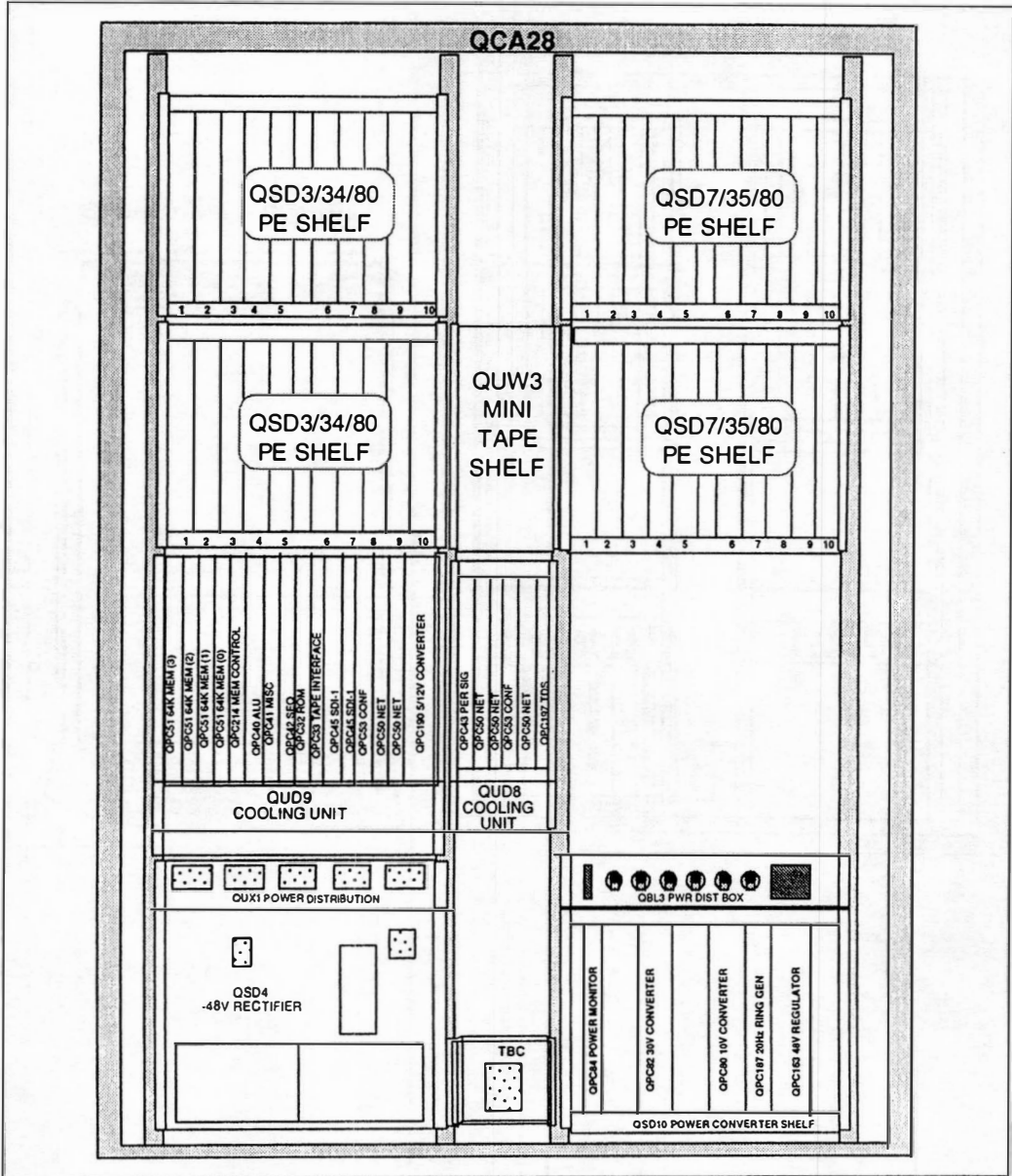
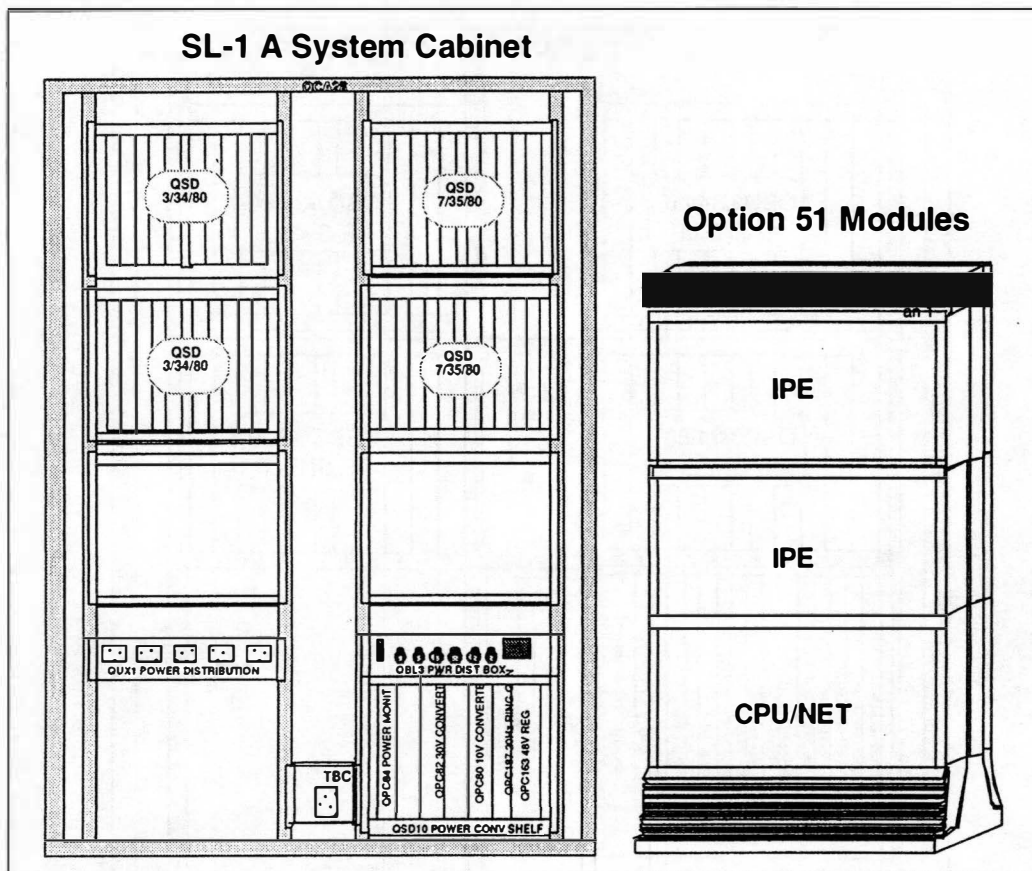


Figure 13-2

Typical QCA28 cabinet that has been upgraded to Meridian 1 Option 51



Installing the Meridian 1 Option 51 system

The Option 51 equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, CPU/Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 51 equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 13-2 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.
- Install cabling:
 - Cable common equipment
 - Cable network loops (within the Option 51 columns only).

Note: Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.

- Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 51 equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 13-3 shows Option 51 circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 13-2**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 13-2 (continued)
NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 13-2 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves				Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."					
For each slave, indicates the slave address				Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."					
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master			on					
	slave			off					
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

Table 13-2 (continued)
NT8D22 system monitor — settings for total number of slaves — SW2 on master

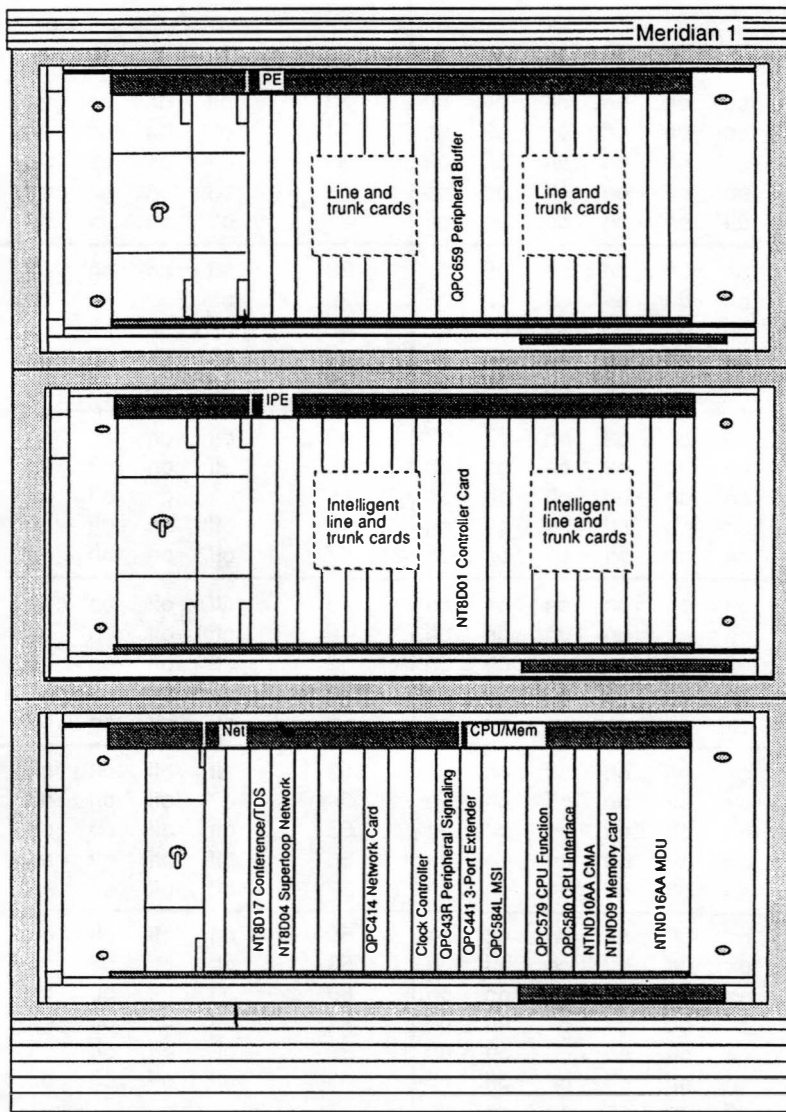
How many slave units	Switch position						How many slave units	Switch position					
	3	4	5	6	7	8		3	4	5	6	7	8
0	on	on	on	on	on	on	32	off	on	on	on	on	on
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
— continued —													

Table 13-2 (continued)

NT8D22 system monitor — slave address — SW2 on slave

Slave unit address		Position						Slave unit address		Position					
		3	4	5	6	7	8			3	4	5	6	7	8
1		on	on	on	on	on	off	33		off	on	on	on	on	off
2		on	on	on	on	off	on	34		off	on	on	on	off	on
3		on	on	on	on	off	off	35		off	on	on	on	off	off
4		on	on	on	off	on	on	36		off	on	on	off	on	on
5		on	on	on	off	on	off	37		off	on	on	off	on	off
6		on	on	on	off	off	on	38		off	on	on	off	off	on
7		on	on	on	off	off	off	39		off	on	on	off	off	off
8		on	on	off	on	on	on	40		off	on	off	on	on	on
9		on	on	off	on	on	off	41		off	on	off	on	on	off
10		on	on	off	on	off	on	42		off	on	off	on	off	on
11		on	on	off	on	off	off	43		off	on	off	on	off	off
12		on	on	off	off	on	on	44		off	on	off	off	on	on
13		on	on	off	off	on	off	45		off	on	off	off	on	off
14		on	on	off	off	off	on	46		off	on	off	off	off	on
15		on	on	off	off	off	off	47		off	on	off	off	off	off
16		on	off	on	on	on	on	48		off	off	on	on	on	on
17		on	off	on	on	on	off	49		off	off	on	on	on	off
18		on	off	on	on	off	on	50		off	off	on	on	off	on
19		on	off	on	on	off	off	51		off	off	on	on	off	off
20		on	off	on	off	on	on	52		off	off	on	off	on	on
21		on	off	on	off	on	off	53		off	off	on	off	on	off
22		on	off	on	off	off	on	54		off	off	on	off	off	on
23		on	off	on	off	off	off	55		off	off	on	off	off	off
24		on	off	off	on	on	on	56		off	off	off	on	on	on
25		on	off	off	on	on	off	57		off	off	off	on	on	off
26		on	off	off	on	off	on	58		off	off	off	on	off	on
27		on	off	off	on	off	off	59		off	off	off	on	off	off
28		on	off	off	off	on	on	60		off	off	off	off	on	on
29		on	off	off	off	on	off	61		off	off	off	off	on	off
30		on	off	off	off	off	on	62		off	off	off	off	off	on
31		on	off	off	off	off	off	63		off	off	off	off	off	off
32		off	on	on	on	on	on								

Figure 13-3
Meridian 1 Option 51 CPU/Network and IPE modules



Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 51: one designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 51, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Note: Depending on the power configuration used it may be required to do modifications to the existing cabinets. If modifications are required, do them as part of the cut-over procedures (described later in this document) to avoid unnecessary interruption of service to the end users.

Connect the DC power to the Option 51 columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 51 equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 51 module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 51 modules.

- a new power source installed in conjunction with the Option 51.

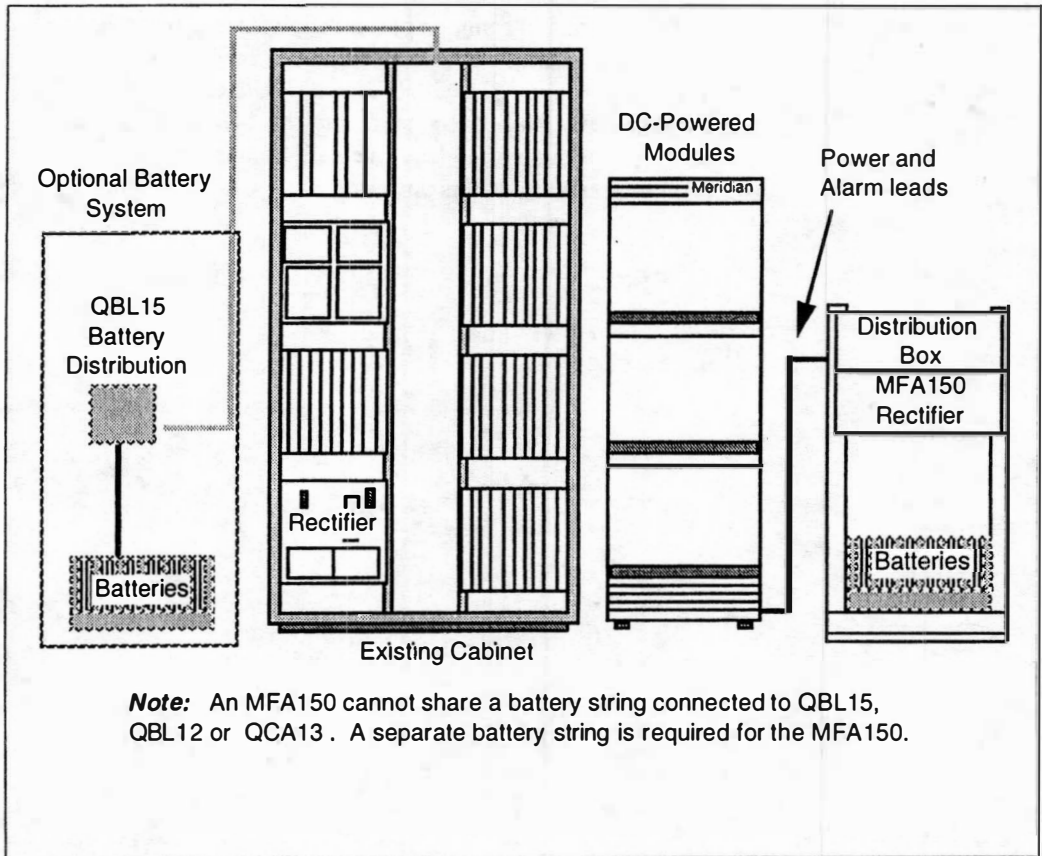
To determine the power requirements for the Option 51 system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 13-4 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 51 modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 51 column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 13-4

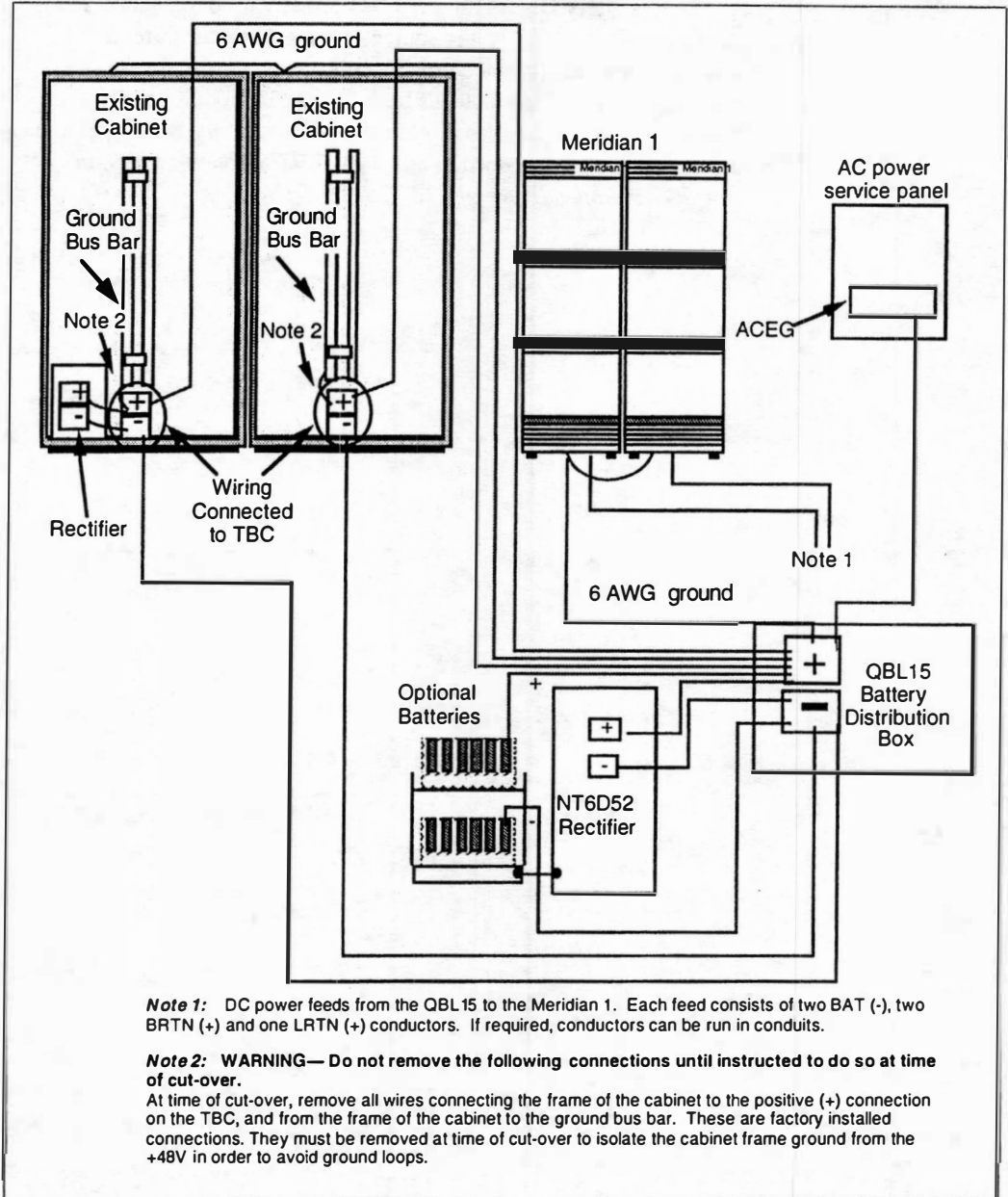
Typical arrangement of independently DC-powered Meridian 1 Option 51 modules



Common power source

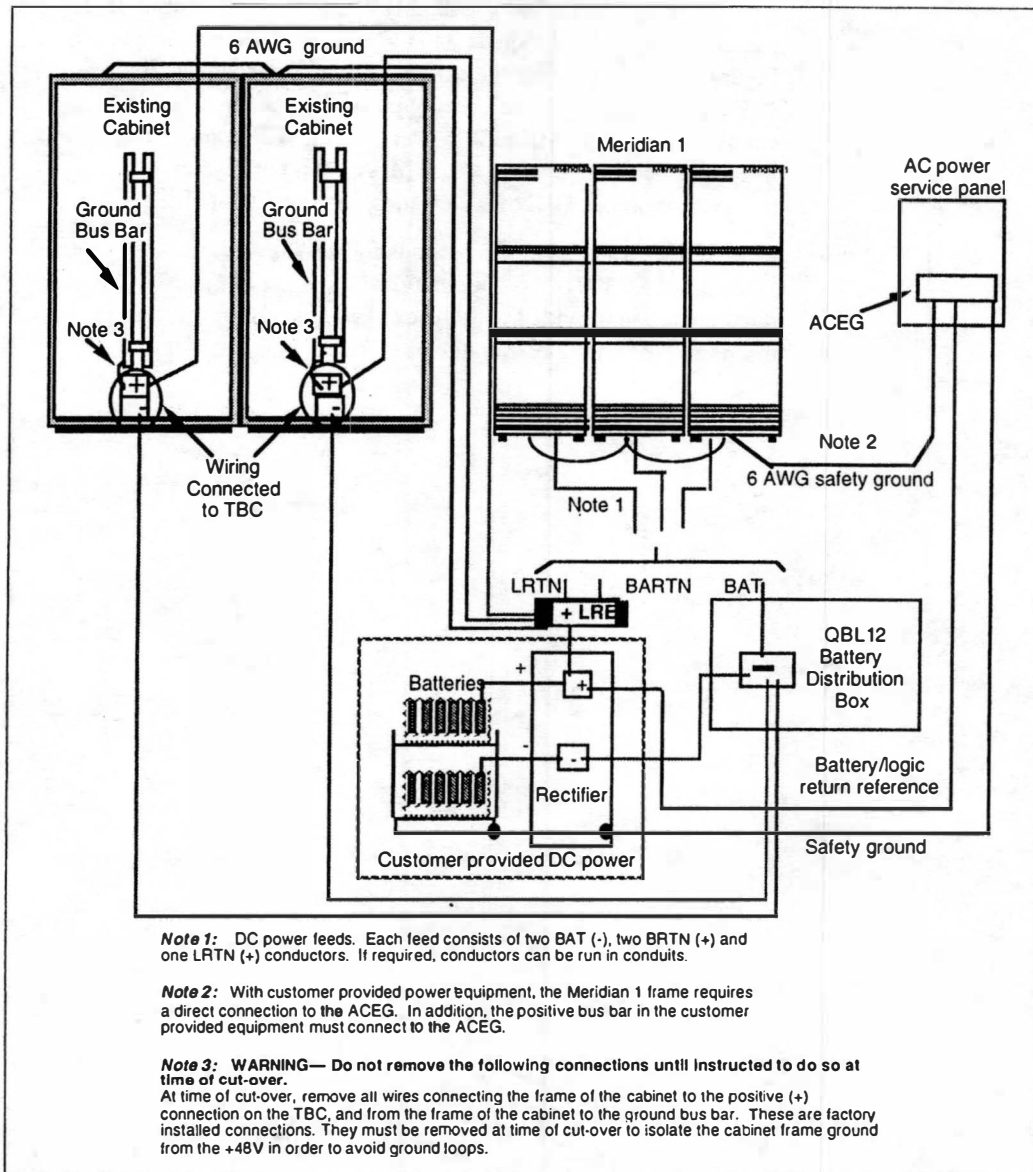
Existing cabinet rectifier as a common power source

- When the existing cabinet DC power source is used as a common power source for the cabinet and the column, any QSD4 rectifier will have to be replaced with a QRF8 rectifier and the existing battery distribution box will have to be replaced with a QBL15 battery distribution box. For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 13-5 illustrates a common power supply arrangement for the upgraded system. This includes both Option 51 modules and the existing cabinet. Option 51 consists of two CPU/Network modules and an IPE module. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

Figure 13-5**Typical arrangement using a common DC power supply with optional battery backup**

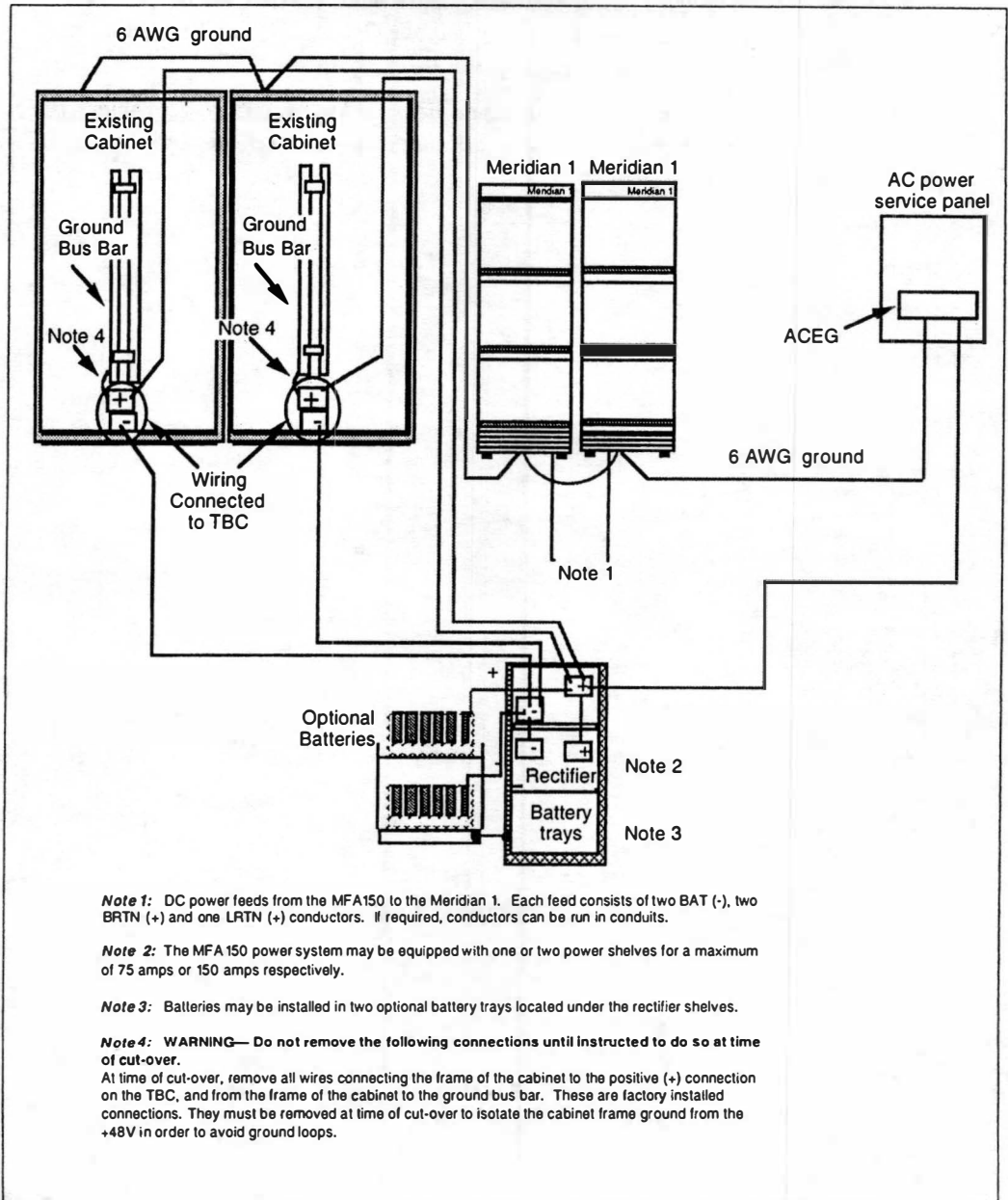
Customer provided power as a common power source

- A QBL12 Battery Distribution Box is normally used to connect to a customer provided DC power source. Figure 13-6 illustrates a customer provided common power supply arrangement for the upgraded system. This includes both Option 51 modules and the existing cabinet. A full description of QBL12 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 13-6**Typical arrangement using a customer provided common DC power supply**

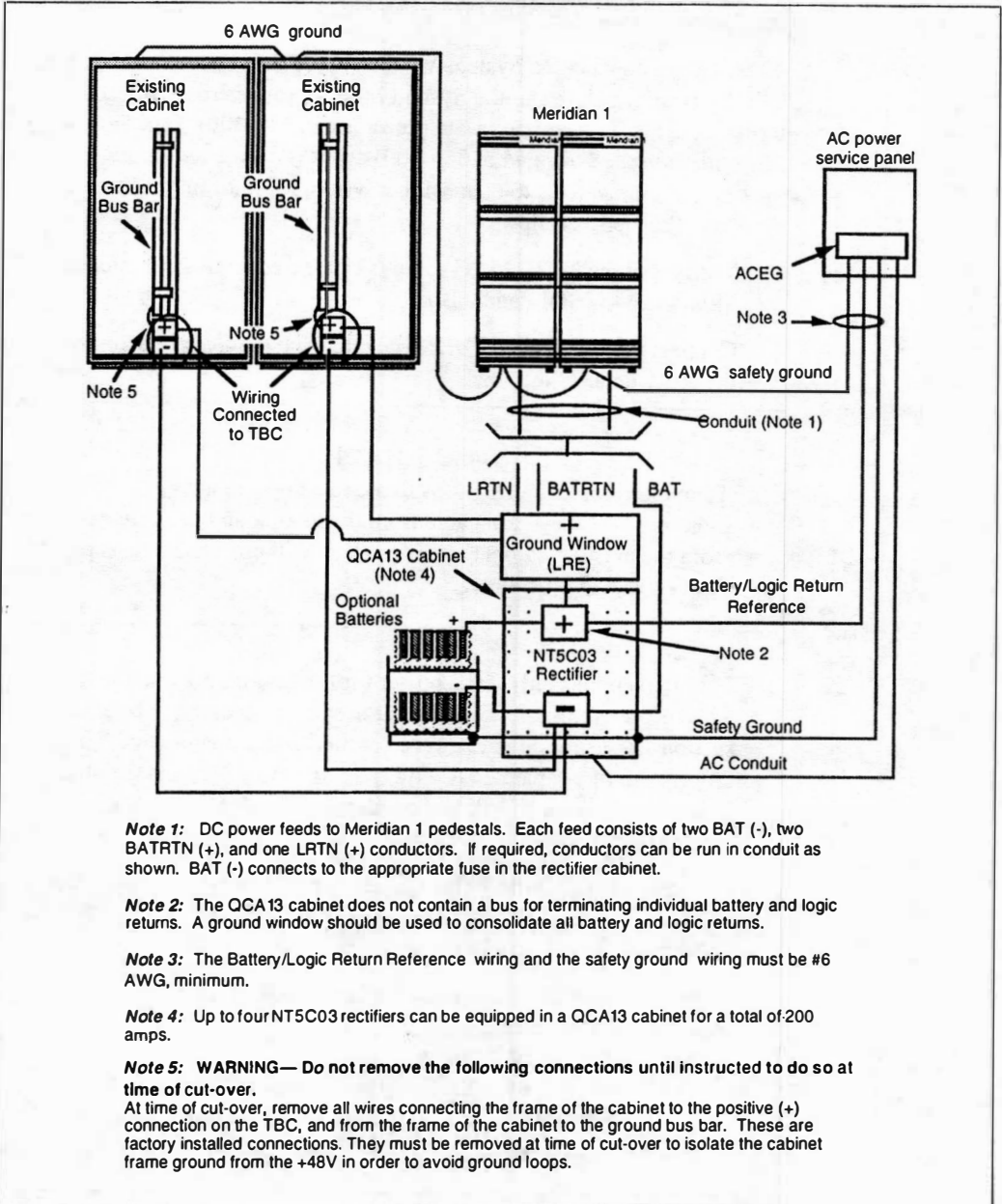
An MFA150 power system as a common power source

- An MFA150 power system assembly can be used as a common power source for both the Option 51 and the existing cabinets as shown in Figure 13-7. To connect the existing cabinets, disconnect the + and - 48V power leads from the existing power source, then reroute and connect them to the MFA150 power system. The connections are located under the top cover of the MFA150 power system. The connections at the TBC of the existing cabinet do not change.
- More information about connections for the MFA150 power system is located in 553-3001-210, *System installation procedures*. Refer to the documentation provided with the existing system for information about disconnecting and removing the old rectifier and batteries.

Figure 13-7**Typical arrangement using an MFA150 power system as a common power source**

An existing QCA13 power cabinet as a common power source

- A QCA13 power cabinet equipped with rectifiers can be used as a common power source for both the Option 21E and the existing cabinets as shown in Figure 13-8.
- For information about connections for the QCA13 power cabinet, refer to 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 13-8**Typical arrangement using a QCA13 as a common power source**

Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 51 modules.

These cables connect the System Monitor to the SDI Paddle Board in the CPU/Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section 'Separate power source' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 13-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 51 system:

- 1 Power up and initially load the Option 51 column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.

- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
 - 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *On-site software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
 - 4 The Meridian 1 Option 51 system is now operational.
-

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 51 column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 Connect an NT8D86 cable between the connector on the faceplate of the network card and the I/O panel of the Option 51. One cable is required for each network loop.
- 2 Connect an NT8D73 shielded cable, up to 30 ft (9 m) in length, to the connector on the I/O panel of the Option 51. Route the NT8D73 cable to the existing cabinet. Do not connect it to the Peripheral Buffer card in the existing cabinet at this time.

Note: Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

- 3 If required in the existing cabinet (see Note) connect an NT8D86 cable to the connector on the NT8D73 shielded cable from the Option 51. Make sure that the connectors are locked together with the locking devices. Do not connect the cable to the faceplate of the Peripheral Buffer card at this time. It will be connected as part of the cutover procedure.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable.

Cutting-over

The following procedure describes how to cut-over to the Option 51 system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL12 or QCA13 unit**
Remove the fuses from the -48V fuse panel corresponding to each cabinet and column.
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.
Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.
 - **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
- 2 If required, perform power modifications to the existing cabinets.
- 3 In the existing cabinets, remove the wiring connecting the frame of the cabinet to the positive (+) connection of the TBC, and the wiring connecting the frame to the cabinet ground bus bar. Refer to Figures 13-5 through 13-7.

Note: This wiring was factory installed. It must be removed to avoid ground loops when existing cabinets are used with Meridian 1 modules.

- 4 This step applies only to Meridian 1 modules connected to a DC power source.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 13-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
 - the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.
- 5 This step applies only if a new common power source with battery backup connected to a QBL12 or QBL15 battery distribution box is to be used.

Note: This step does not apply if the common power source uses an MFA150 rectifier.

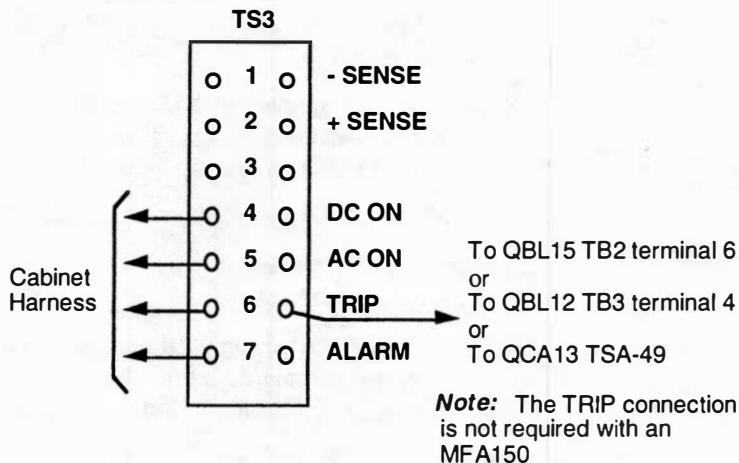
A TRIP lead must be connected to the TRIP connection on:

- the TRIP terminal on the terminal strip on the rectifier in existing cabinets equipped with a rectifier.
- the TRIP terminal of TS3 in existing cabinets not equipped with a rectifier.

The TRIP leads must be connected as follows.

If the existing rectifier is being removed from the cabinet, make the following wiring changes.

- a) If not already connected to TS3, tag and move the cabinet harness DC ON, AC ON, TRIP and ALARM leads presently connected on the rectifier to TS3 as shown in the above drawing. Depending on the type of existing cabinet, the TS3 is located either on the cabinet's TBC block, or on the QUT3 power unit.



- b) Install and connect a 16 AWG wire from terminal 6 (TRIP) on TS3 to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connections in each cabinet with 16 AWG wire.
- c) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.

Note: The DC ON, AC ON and ALARM lead functions are performed by the Meridian 1 module. Leaving these leads connected in the existing cabinets only extends the alarm indicators to the QPC84 power monitors. If you wish, you may leave these leads disconnected. However, the TRIP lead must be connected.

If the existing rectifier is to remain in the cabinet, make the following wiring changes.

- a) Install and connect a 16 AWG wire from the TRIP connection on the terminal strip of the rectifier to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connection on the terminal strip of the rectifier in each cabinet with 16 AWG wire. In existing cabinets not equipped with a rectifier (such as a QCA7 cabinet powered by a QCA8 cabinet), 'daisy chain' to the TRIP connection on TS3.
 - b) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.
- 6 Cross-connect the alarm cables as shown in Figure 13-10.
 - 7 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.
 - 8 Connect the NT8D86 cables (if provided) or NT8D73 shielded network cables from the Option 51 to the connector on the faceplate of the Peripheral Buffer circuit card in the existing cabinets.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable. The NT8D73 shielded cable can be connected directly to the connector of the Peripheral Buffer card.

—OR—

If the existing cabinet is equipped to suppress EMI, the NT8D73 shielded cable should be connected to its assigned filter connector. See 553-3001-150, *Upgrade Engineering* for more information.

- 9 Remove the QPC84 Power Monitor from the QCA28 cabinet and set switch C11, positions 1 and 2 to ON to disable monitoring the power in the CE shelf. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required. Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.

Note: Disregard any remaining alarm indications. Alarm indications should return to normal once the upgrade is completed and equipment that is no longer required has been removed as described later in this chapter.

- 10 Restore power to the cabinets and column by reinserting the removed fuse and resetting all circuit breakers to ON.

CAUTION

Do not remove the NT8D22 system monitor (XSM) from the column while the system is in service. Removing the XSM may cause the input circuit breakers on the existing cabinets to trip.

- 11 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.
-

Figure 13-9
NT8D46 cable types

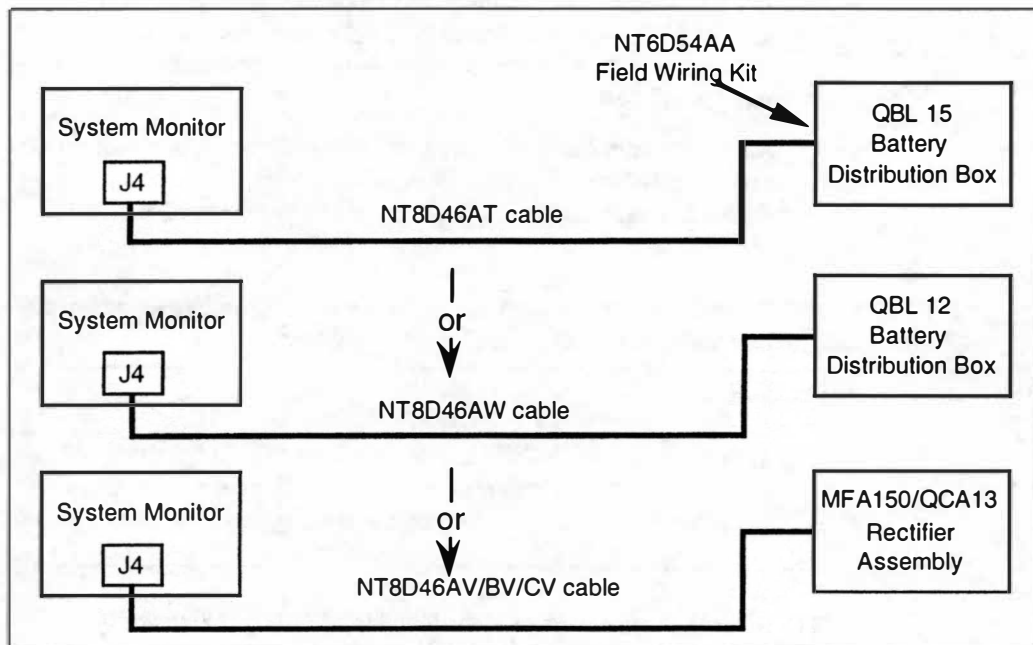
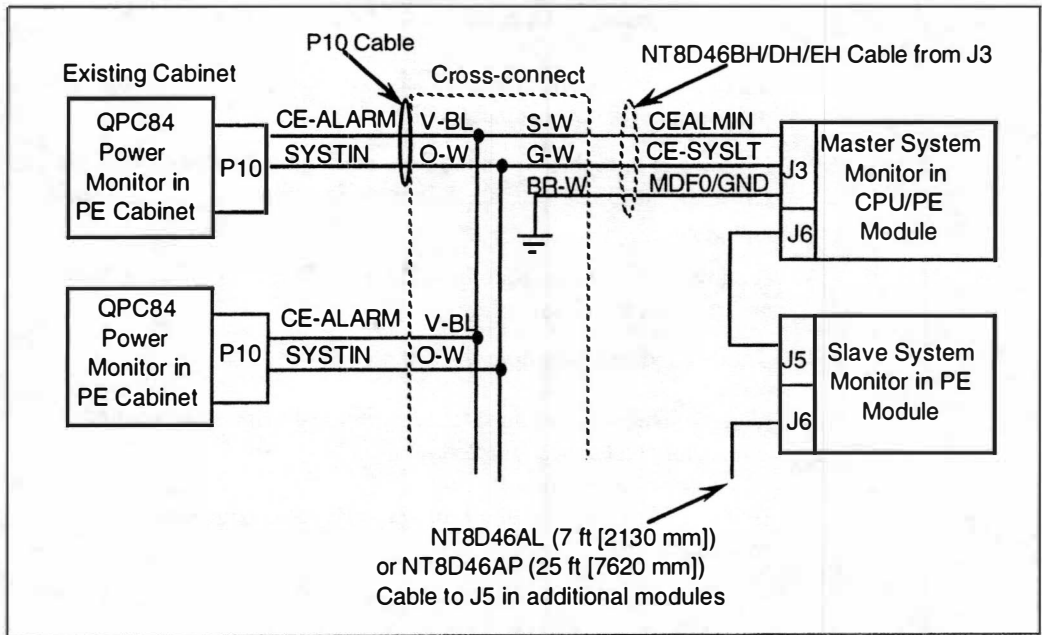


Figure 13-10
Connecting alarm cables between a cabinet and a column



Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

Removing equipment no longer required

The following procedure describes how to remove the equipment that is no longer required once the Option 51 is operating normally.

- 1 Set circuit breakers for the CE shelves on the QBL3 power distribution panel in the QCA28 cabinet to OFF.
- 2 Disconnect the cables from the front of all circuit cards on the QSD18 CE shelf, the QSD19 CE shelf, if equipped, and the QSD2 CE shelf, if equipped.
- 3 Remove circuit cards from the QSD18, QSD19, or QSD2 CE shelves and store them in a safe place.
- 4 Remove the tape unit from the cabinet.

Note: The tape unit must first be removed before the tape unit connector can be disconnected.

- 5 If you are using the CE shelf for DTI/PRI cards without clock reference:
 - Install DTI/PRI cards into card slots 6, 8, 10, and 12 in shelves QSD18 and QSD19, if equipped.
 - Install DTI/PRI cards into card slots 2, 6, 8, 10, and 12 in shelf QSD2, if equipped.
 - Replace the QPC85 Power Converter with a QPC190 or a QPC355 Power Converter to support maximum number of DTI/PRI cards.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the CPU/Network module of the Option 21E upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breakers for the CE shelves on the power distribution panel to ON.

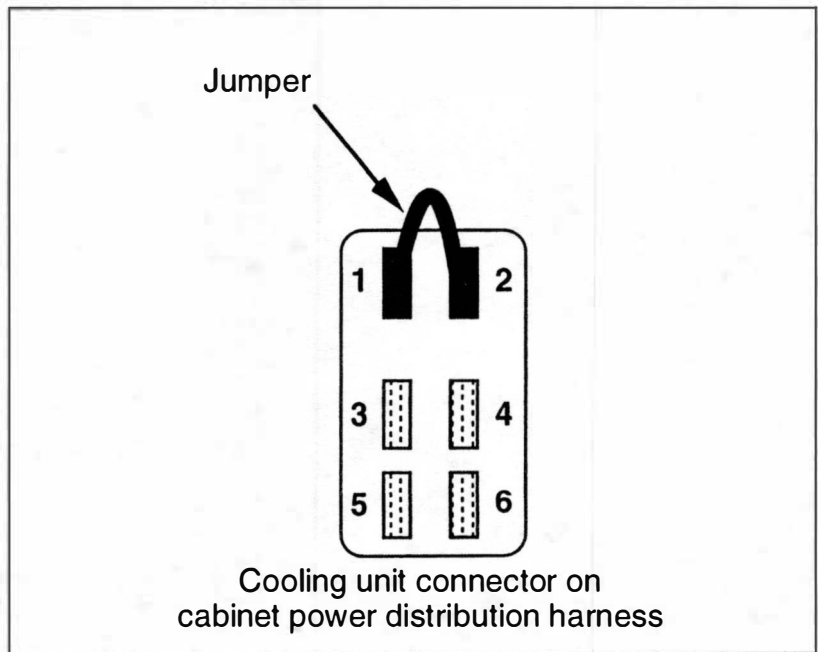
6 If you are not going to use the CE shelf for DTI/PRI cards:

- Disconnect power connectors and alarm connectors from the QSD18 shelf, the QSD19, or the QSD2 shelf, if equipped. Tape all exposed power leads with electrical insulation tape.

Note: If the cabinet is equipped with an expansion CE shelf (a second CE shelf) disconnect and remove the wiring between the +5V, +12V, -12V, and LGND connections on the CE shelf.

- Disconnect all CE alarm connectors.
- Tape all exposed power leads with electrical insulation tape.
- Disconnect and remove the QUD4, 6 and /or 8 cooling unit. Place a jumper (a piece of 24 or 26 AWG bare wire or a paper clip can be used) across power monitor leads 1 and 2 of the cooling unit power connector as shown in Figure 13-11. This disables the alarm for the removed cooling unit.

Figure 13-11
Cooling unit alarm connection



SL-1 QCA37 cabinet upgrade to Meridian 1 Option 51

This procedure is used to upgrade an SL-1 QCA37 cabinet (M, MS, ST, 21or 21E) to Meridian 1 Option 51. To upgrade to a Meridian 1 Option 51 system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 51 is operating with the new software provided with the Option 51.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Modular upgrade of an SL-1 QCA37 cabinet (M, MS, ST, 21 or 21E) to Meridian 1 Option 51

Equipment required

Table 14-1 lists minimum hardware requirements needed to upgrade to a DC powered Meridian 1 Option 51 system.

Table 14-1

Minimum hardware requirements for a DC Meridian 1 Option 51

Quantity	Part number	Description
1	NT6D39DC	CPU/Network Module DC
1	NT6D41AB	CE Power Supply DC
1	NT7D00BA	Top Cap DC
1	NT7D09CA	Pedestal DC
1	NT7D10CA	System Monitor Panel Assembly
1	NT7D67CA	Power Distribution Unit and filter assembly
1	NT8D17EA	Extended Conference/TDS Card
1	NT8D22AC	System Monitor
1	NT8D41AA	2 Port SDI Paddle Board
1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	NT8D46BH	System Monitor to MDF Cable
1	NT8D52DD	Pedestal Blower Unit DC
1	NT8D78AA	CPU Cable
1	NT8D80AB	MSI to MDU Cable, 2 ft (610 mm)
1	NTND08AA	ROM Card
1	NTND09CA	12 MB Memory Card
1	NTND10AA	Changeover & Memory Arbitrator Card
1	NTND16AA	4MB Multi Disk Unit (MDU)
1	QPC43R	Peripheral Signaling Card
-continued-		

Table 14-1 (continued)
Minimum hardware requirements for a DC Meridian 1 Option 51

Quantity	Part number	Description
1	NT8D84AA	XSDI to I/O panel Cable
1	NT8D93AJ	XSDI to TTY cable, 16 ft (4875 mm)
1	QPC84Q	Power Monitor
1	QPC441F	3 Port Extender Card
1	QPC579	CPU Function Card
1	QPC580C	CPU Interface Card
1	QPC584L	Mass Storage Interface Card
1	QPC477A-09	Bus Terminating Unit
1	QPC477A-10	Bus Terminating Unit
1	QPC477B-22	Bus Terminating Unit

Note: The vintages shown on circuit cards in Table 14-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA37 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 51 Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 51 to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 51 to the existing cabinet.
- A second NT8D86 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Note: The second NT8D86 cable is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as a QCA7 or 8) do not require the second NT8D86 cable since the NT8D73 cable can be connected directly to the Peripheral Buffer connector. For existing cabinets equipped to suppress EMI, refer to 553-3001-150, *Upgrade Engineering*.

Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 51 system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 14-1 shows a typical QCA37 cabinet and Figure 14-2 shows a QCA37 cabinet that has been upgraded to Meridian 1 Option 51.

Figure 14-1
Typical QCA37 cabinet

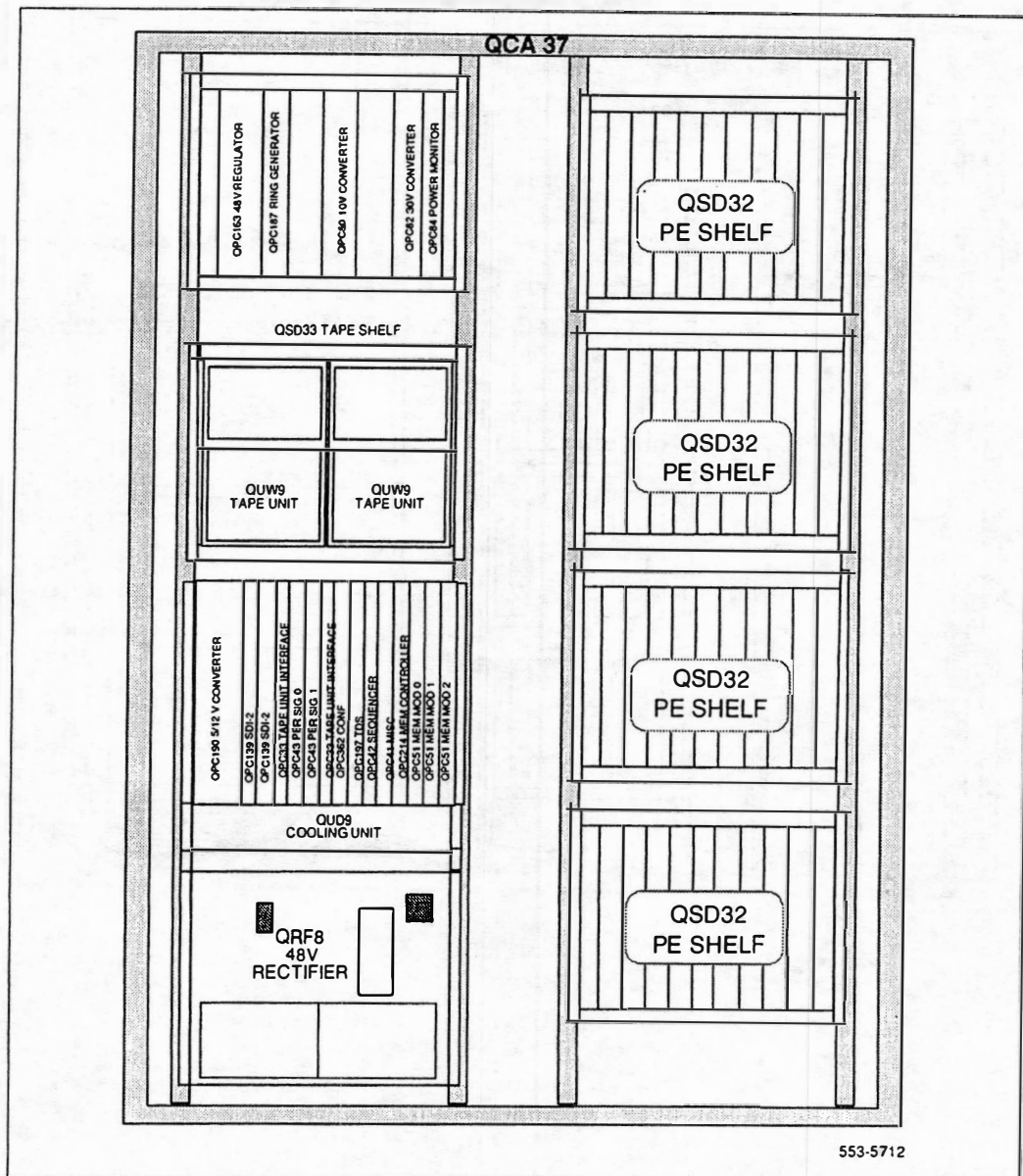
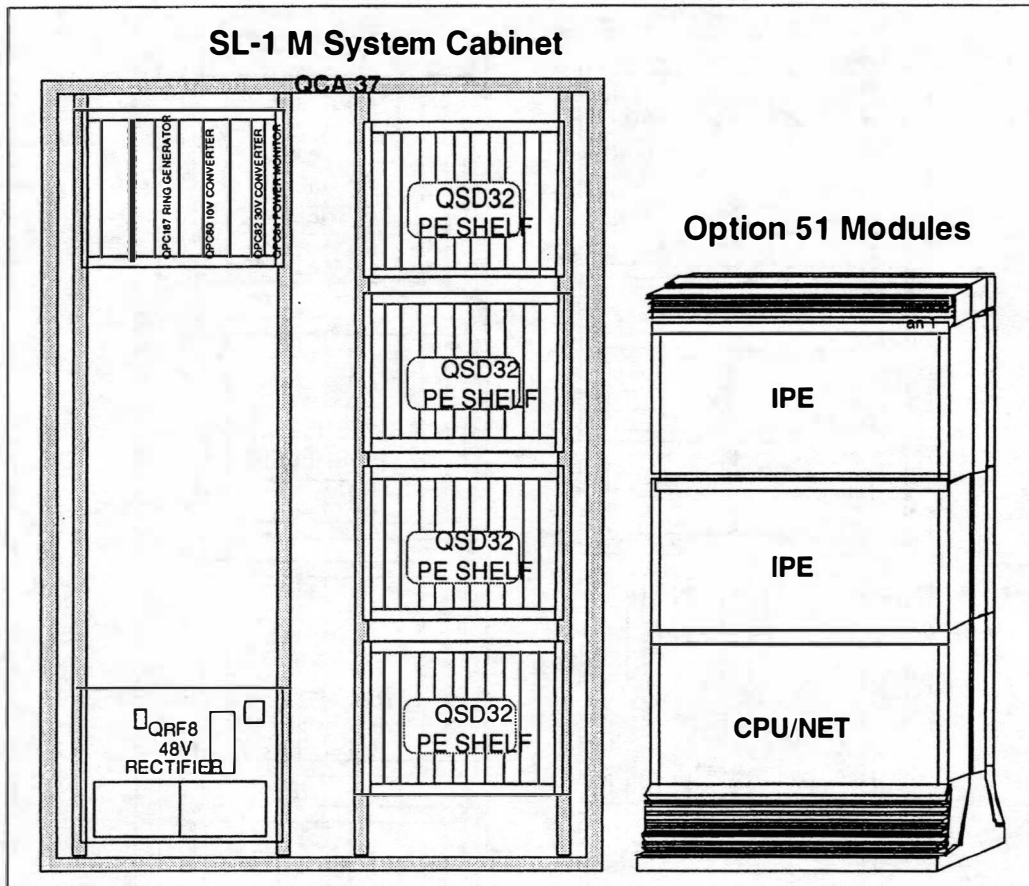


Figure 14-2

Typical QCA37 cabinet that has been upgraded to Meridian 1 Option 51



Installing the Meridian 1 Option 51 system

The Option 51 equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, CPU/Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 51 equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 13-2 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.
 - Install cabling:
 - Cable common equipment
 - Cable network loops (within the Option 51 columns only).
- Note:* Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.
- Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 51 equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 14-3 shows Option 51 circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 14-2**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 14-2 (continued)**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 14-2 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves				Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."					
For each slave, indicates the slave address				Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."					
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master		on						
	slave		off						
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

Table 14-2 (continued)

NT8D22 system monitor — settings for total number of slaves — SW2 on master

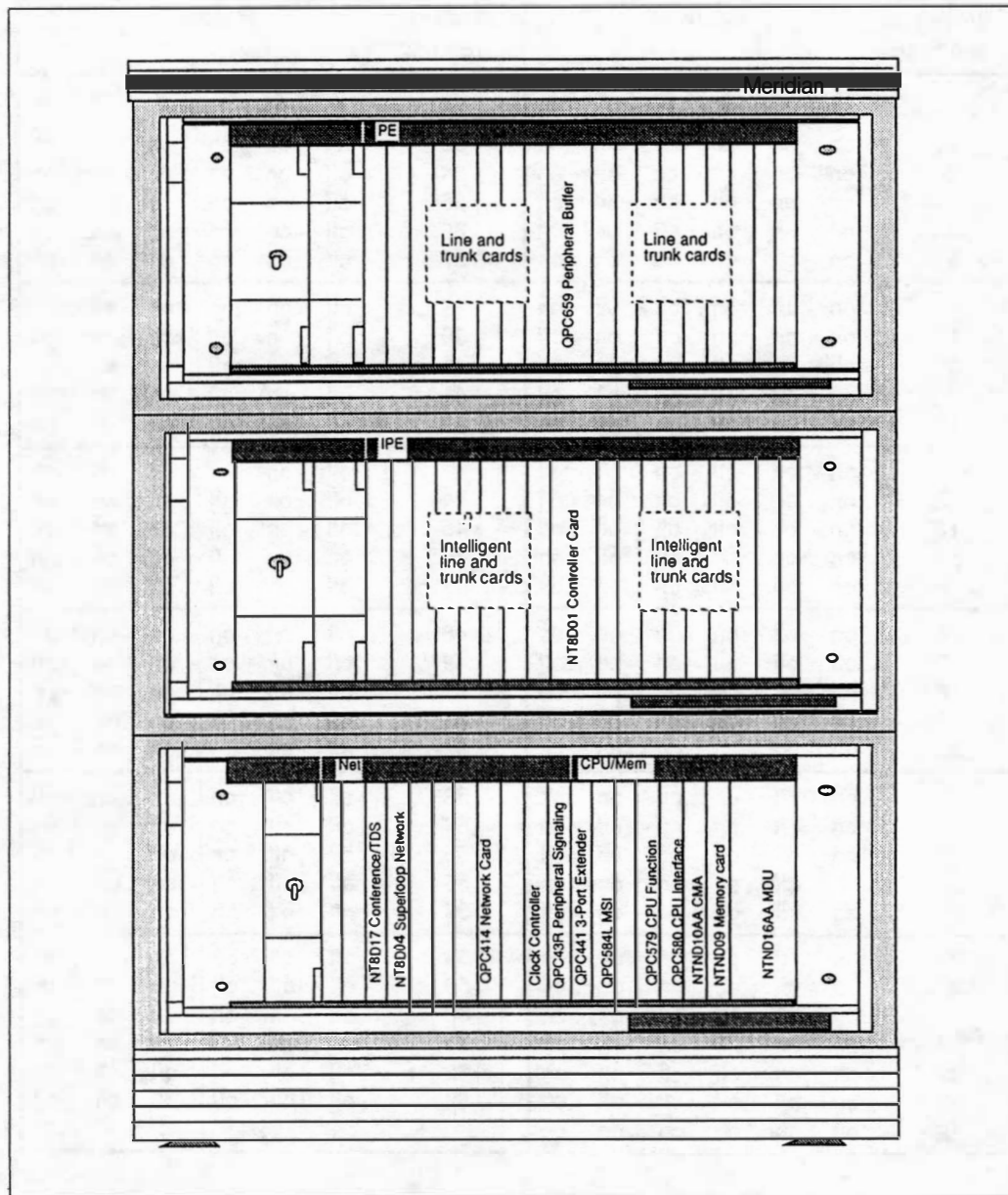
How many slave units	Switch position						How many slave units	Switch position					
	3	4	5	6	7	8		3	4	5	6	7	8
0	on	on	on	on	on	on	32	off	on	on	on	on	on
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
— continued —													

Table 14-2 (continued)

NT8D22 system monitor — slave address — SW2 on slave

Slave unit address		Position						Slave unit address		Position					
		3	4	5	6	7	8			3	4	5	6	7	8
1		on	on	on	on	on	off	33		off	on	on	on	on	off
2		on	on	on	on	off	on	34		off	on	on	on	off	on
3		on	on	on	on	off	off	35		off	on	on	on	off	off
4		on	on	on	off	on	on	36		off	on	on	off	on	on
5		on	on	on	off	on	off	37		off	on	on	off	on	off
6		on	on	on	off	off	on	38		off	on	on	off	off	on
7		on	on	on	off	off	off	39		off	on	on	off	off	off
8		on	on	off	on	on	on	40		off	on	off	on	on	on
9		on	on	off	on	on	off	41		off	on	off	on	on	off
10		on	on	off	on	off	on	42		off	on	off	on	off	on
11		on	on	off	on	off	off	43		off	on	off	on	off	off
12		on	on	off	off	on	on	44		off	on	off	off	on	on
13		on	on	off	off	on	off	45		off	on	off	off	on	off
14		on	on	off	off	off	on	46		off	on	off	off	off	on
15		on	on	off	off	off	off	47		off	on	off	off	off	off
16		on	off	on	on	on	on	48		off	off	on	on	on	on
17		on	off	on	on	on	off	49		off	off	on	on	on	off
18		on	off	on	on	off	on	50		off	off	on	on	off	on
19		on	off	on	on	off	off	51		off	off	on	on	off	off
20		on	off	on	off	on	on	52		off	off	on	off	on	on
21		on	off	on	off	on	off	53		off	off	on	off	on	off
22		on	off	on	off	off	on	54		off	off	on	off	off	on
23		on	off	on	off	off	off	55		off	off	on	off	off	off
24		on	off	off	on	on	on	56		off	off	off	on	on	on
25		on	off	off	on	on	off	57		off	off	off	on	on	off
26		on	off	off	on	off	on	58		off	off	off	on	off	on
27		on	off	off	on	off	off	59		off	off	off	on	off	off
28		on	off	off	off	on	on	60		off	off	off	off	on	on
29		on	off	off	off	on	off	61		off	off	off	off	on	off
30		on	off	off	off	off	on	62		off	off	off	off	off	on
31		on	off	off	off	off	off	63		off	off	off	off	off	off
32		off	on	on	on	on	on								

Figure 14-3
Meridian 1 Option 51 CPU/Network and IPE modules



Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 51: one that is designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 51, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Note: Depending on the power configuration used it may be required to do modifications to the existing cabinets. If modifications are required, do them as part of the cut-over procedures (described later in this document) to avoid unnecessary interruption of service to the end users.

Connect the DC power to the Option 51 columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 51 equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 51 module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 51 modules.

- a new power source installed in conjunction with the Option 51.

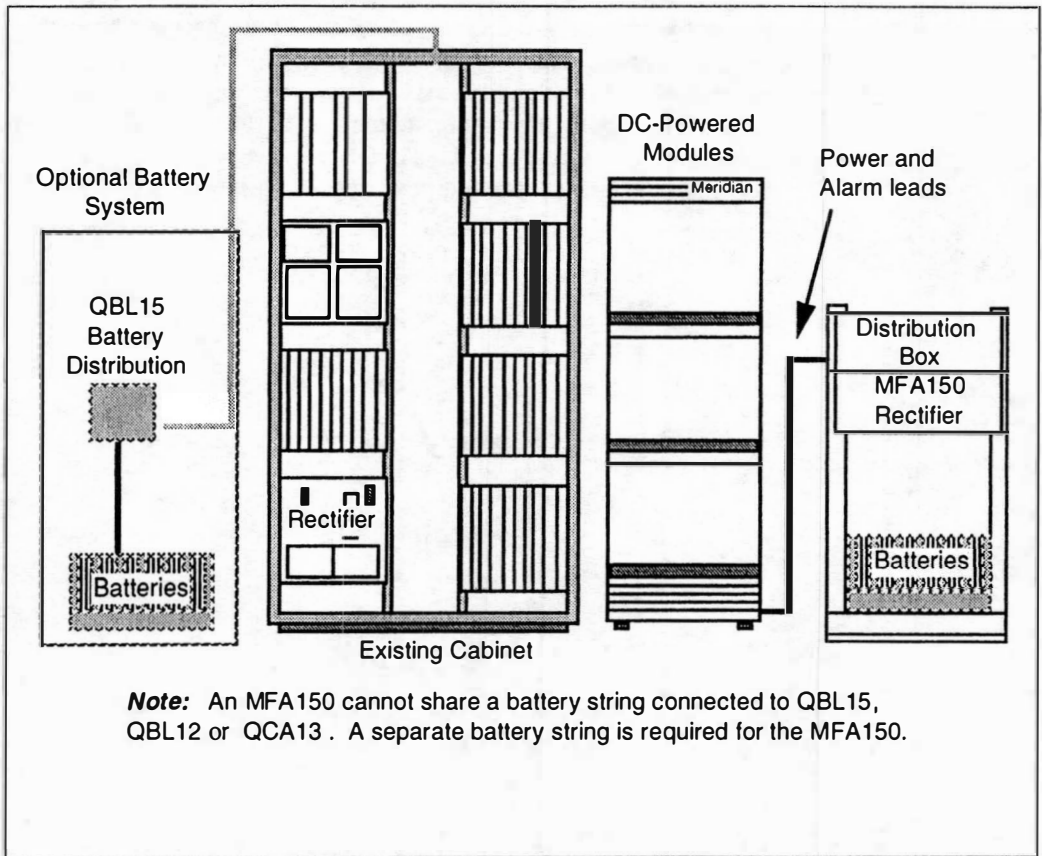
To determine the power requirements for the Option 51 system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 14-4 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 51 modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 51 column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 14-4

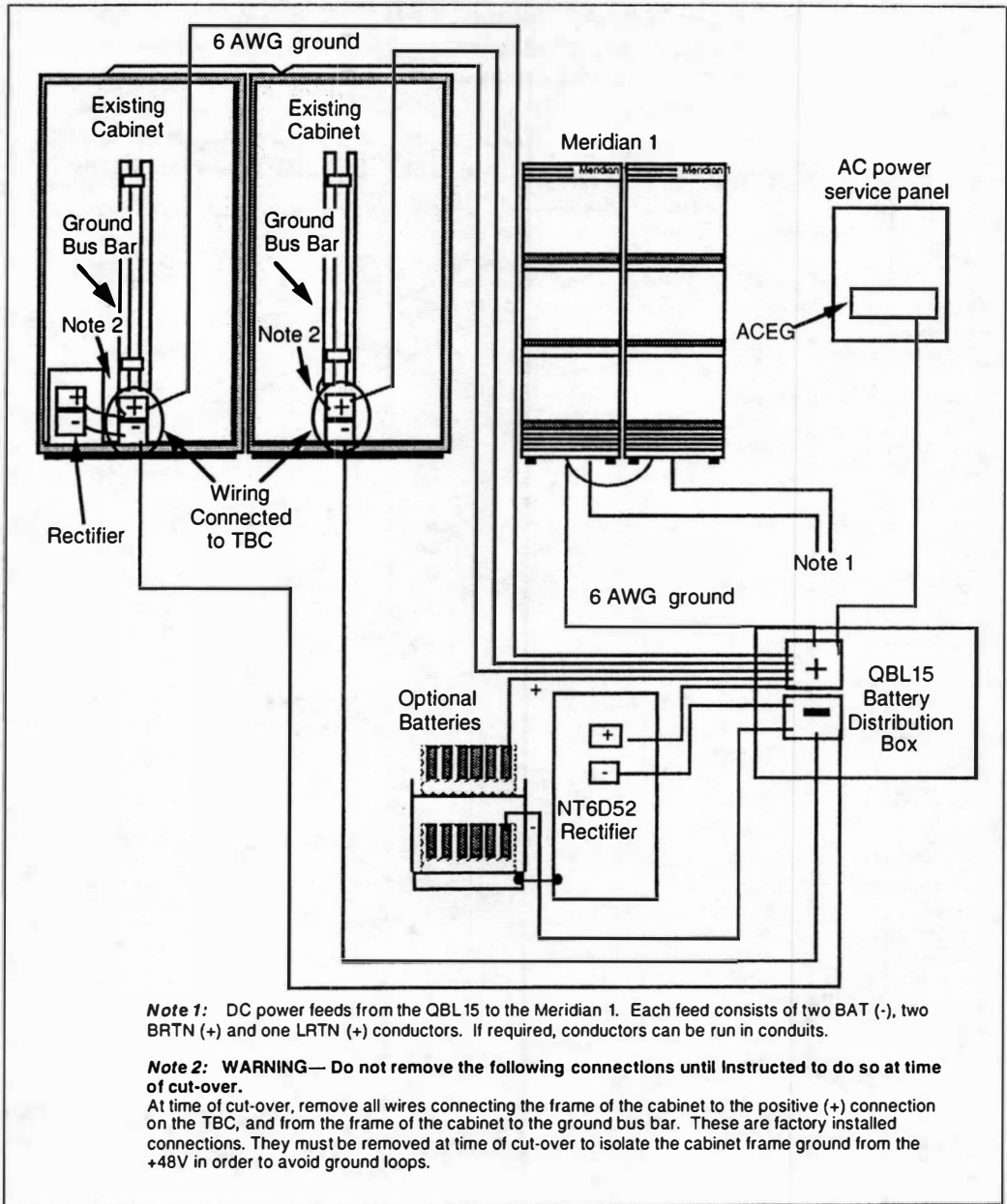
Typical arrangement of independently DC-powered Meridian 1 Option 51 modules



Common power source

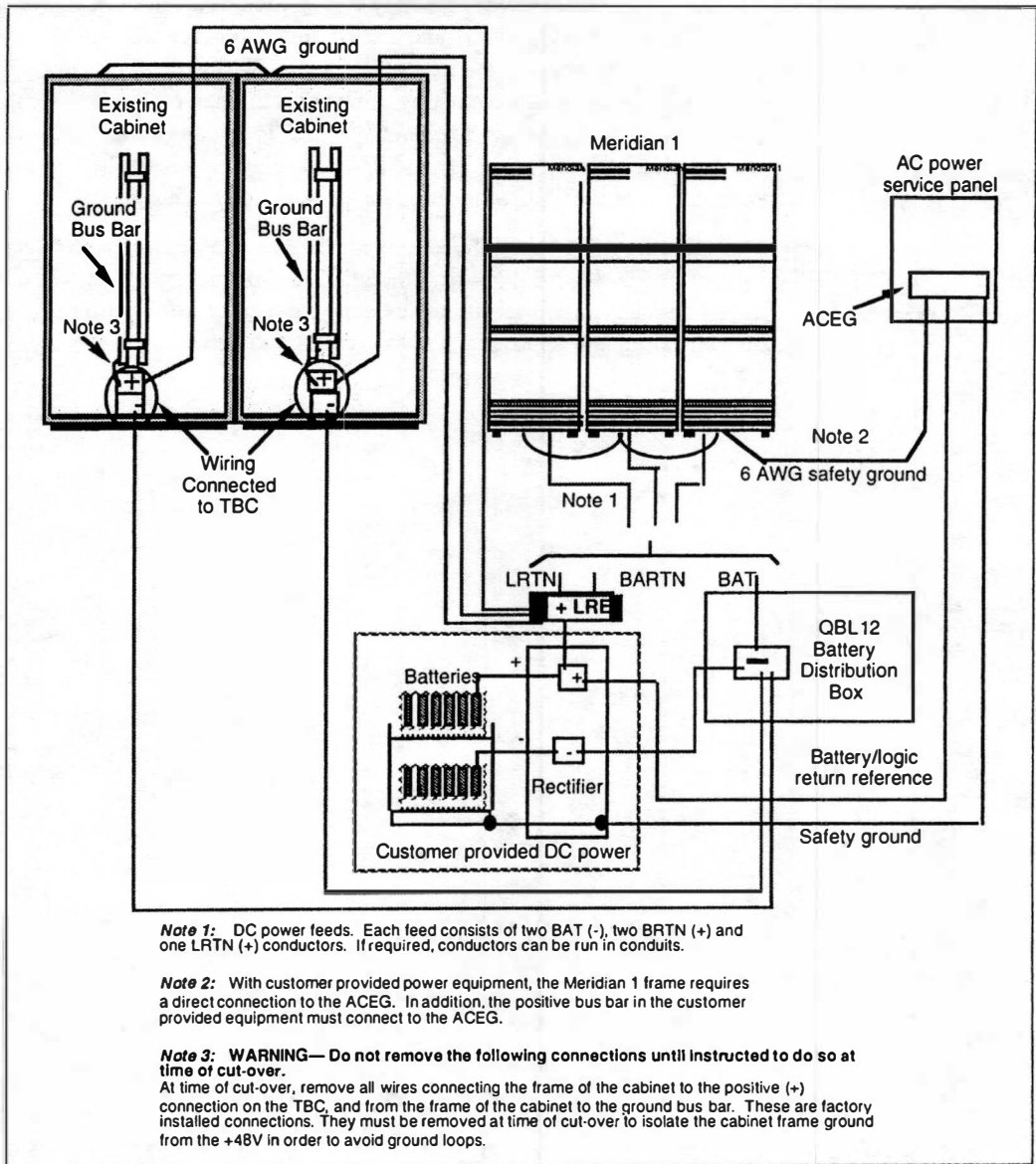
Existing cabinet rectifier as a common power source

- When the existing cabinet DC power source is used as a common power source for the cabinet and the column, any QSD4 rectifier will have to be replaced with a QRF8 rectifier and the existing battery distribution box will have to be replaced with a QBL15 battery distribution box. For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 14-5 illustrates a common power supply arrangement for the upgraded system. This includes both Option 51 modules and the existing cabinet. Option 51 consists of two CPU/Network modules and an IPE module. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

Figure 14-5**Typical arrangement using a common DC power supply with optional battery backup**

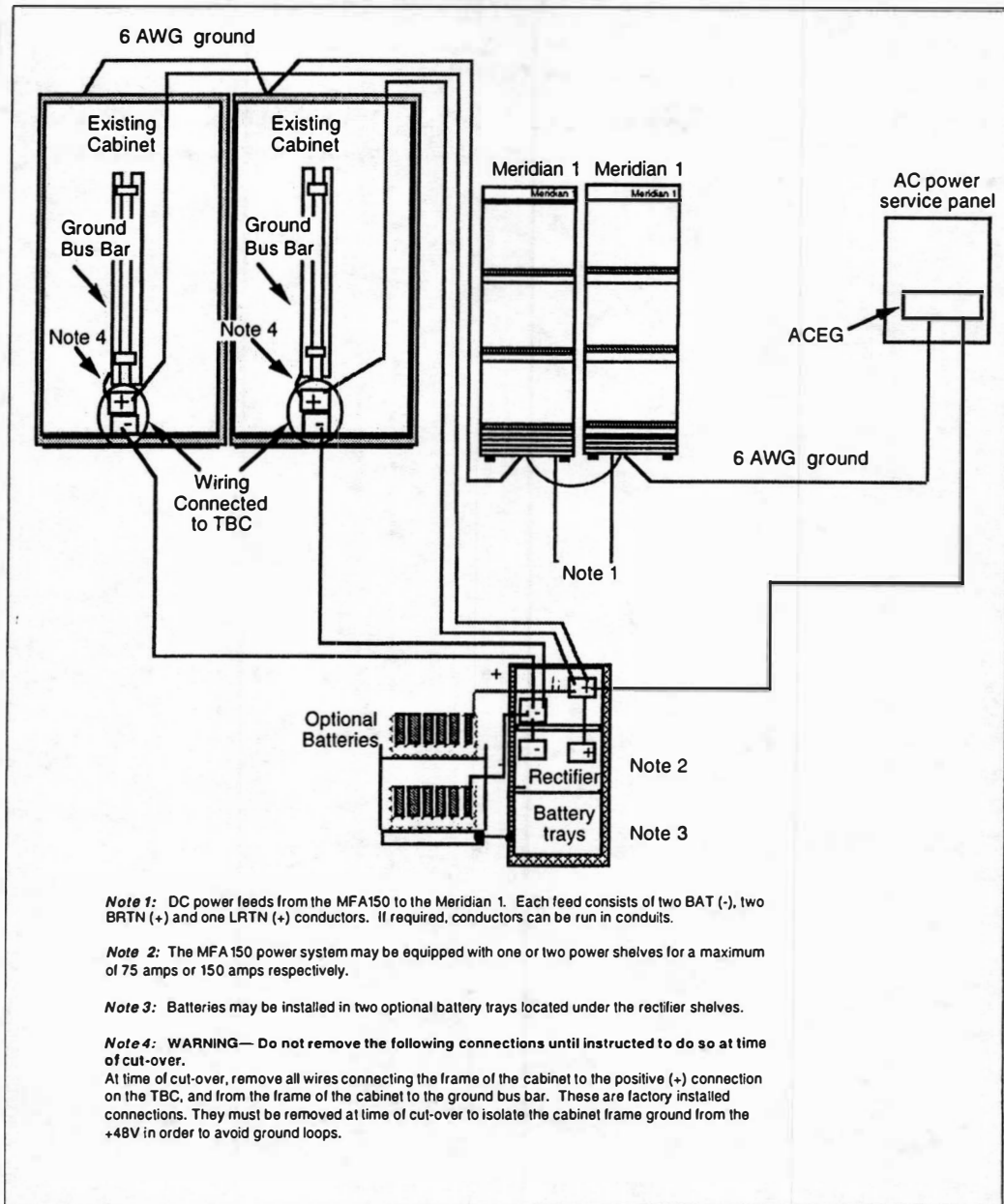
Customer provided power as a common power source

- A QBL12 Battery Distribution Box is normally used to connect to a customer provided DC power source. Figure 14-6 illustrates a customer provided common power supply arrangement for the upgraded system. This includes both Option 51 modules and the existing cabinet. A full description of QBL12 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 14-6**Typical arrangement using a customer provided common DC power supply**

An MFA150 power system as a common power source

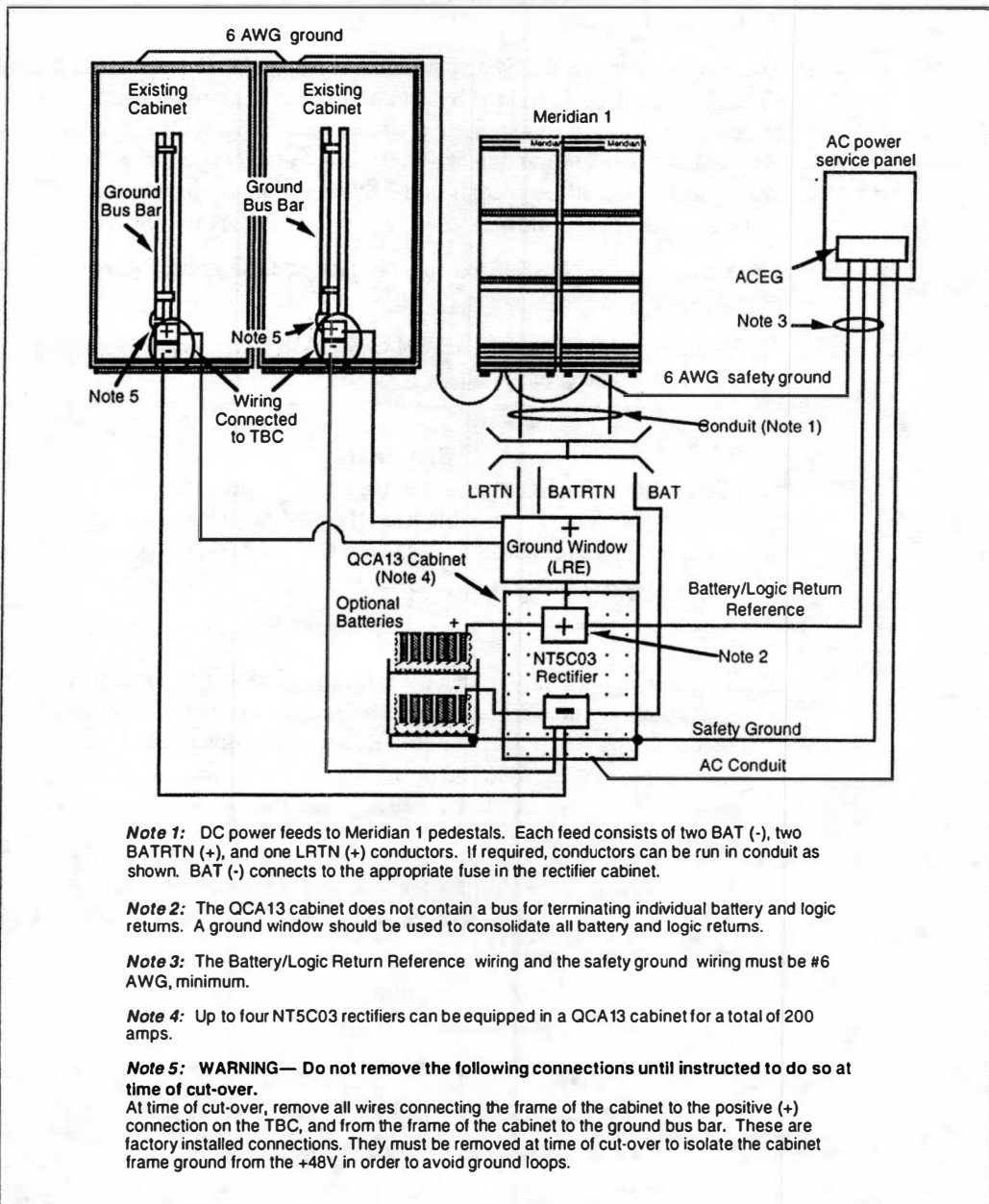
- An MFA150 power system assembly can be used as a common power source for both the Option 51 and the existing cabinets as shown in Figure 14-7. To connect the existing cabinets, disconnect the + and - 48V power leads from the existing power source, then reroute and connect them to the MFA150 power system. The connections are located under the top cover of the MFA150 power system. The connections at the TBC of the existing cabinet do not change.
- More information about connections for the MFA150 power system is located in 553-3001-210, *System installation procedures*. Refer to the documentation provided with the existing system for information about disconnecting and removing the old rectifier and batteries.

Figure 14-7**Typical arrangement using an MFA150 power system as a common power source**

An existing QCA13 power cabinet as a common power source

- A QCA13 power cabinet equipped with rectifiers can be used as a common power source for both the Option 21E and the existing cabinets as shown in Figure 14-8.
- For information about connections for the QCA13 power cabinet, refer to 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 14-8
Typical arrangement using a QCA13 as a common power source



Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 51 modules.

These cables connect the System Monitor to the SDI Paddle Board in the CPU/Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section 'Separate power source' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 14-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 51 system:

- 1 Power up and initially load the Option 51 column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.

- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
 - 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
 - 4 The Meridian 1 Option 51 system is now operational.
-

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 51 column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 Connect an NT8D86 cable between the connector on the faceplate of the network card and the I/O panel of the Option 51. One cable is required for each network loop.
- 2 Connect an NT8D73 shielded cable, up to 30 ft (9 m) in length, to the connector on the I/O panel of the Option 51. Route the NT8D73 cable to the existing cabinet. Do not connect it to the Peripheral Buffer card in the existing cabinet at this time.

Note: Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

- 3 If required in the existing cabinet (see Note) connect an NT8D86 cable to the connector on the NT8D73 shielded cable from the Option 51. Make sure that the connectors are locked together with the locking devices. Do not connect the cable to the faceplate of the Peripheral Buffer card at this time. It will be connected as part of the cutover procedure.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable.

Cutting-over

The following procedure describes how to cut-over to the Option 51 system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL12 or QCA13 unit**
Remove the fuses from the -48V fuse panel corresponding to each cabinet and column.
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.

Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.

- **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
- 2 If required, perform power modifications to the existing cabinets.
 - 3 In the existing cabinets, remove the wiring connecting the frame of the cabinet to the positive (+) connection of the TBC, and the wiring connecting the frame to the cabinet ground bus bar. Refer to Figures 14-5 through 14-7.

Note: This wiring was factory installed. It must be removed to avoid ground loops when existing cabinets are used with Meridian 1 modules.

- 4 This step applies only to Meridian 1 modules connected to a DC power source.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 14-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
 - the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.
- 5 This step applies only if a new common power source with battery backup connected to a QBL12 or QBL15 battery distribution box is to be used.

Note: This step does not apply if the common power source uses an MFA150 rectifier.

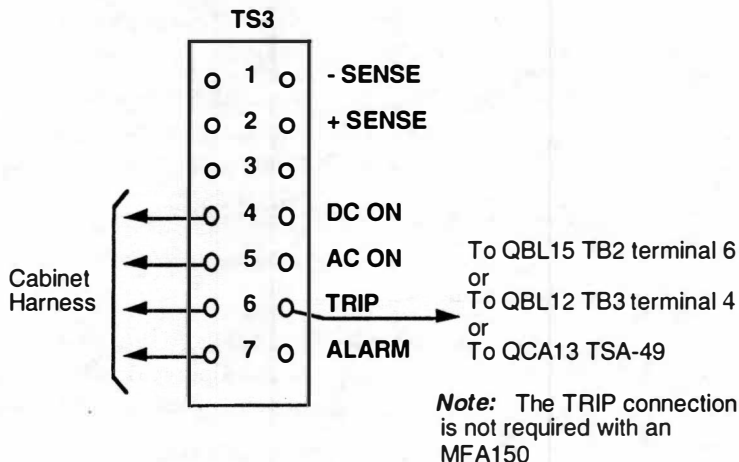
A TRIP lead must be connected to the TRIP connection on:

- the TRIP terminal on the terminal strip on the rectifier in existing cabinets equipped with a rectifier.
- the TRIP terminal of TS3 in existing cabinets not equipped with a rectifier.

The TRIP leads must be connected as follows.

If the existing rectifier is being removed from the cabinet, make the following wiring changes.

- a) If not already connected to TS3, tag and move the cabinet harness DC ON, AC ON, TRIP and ALARM leads presently connected on the rectifier to TS3 as shown in the above drawing. Depending on the type of existing cabinet, the TS3 is located either on the cabinet's TBC block, or on the QUT3 power unit.



- b) Install and connect a 16 AWG wire from terminal 6 (TRIP) on TS3 to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connections in each cabinet with 16 AWG wire.
- c) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.

Note: The DC ON, AC ON and ALARM lead functions are performed by the Meridian 1 module. Leaving these leads connected in the existing cabinets only extends the alarm indicators to the QPC84 power monitors. If you wish, you may leave these leads disconnected. However, the TRIP lead must be connected.

If the existing rectifier is to remain in the cabinet, make the following wiring changes.

- a) Install and connect a 16 AWG wire from the TRIP connection on the terminal strip of the rectifier to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connection on the terminal strip of the rectifier in each cabinet with 16 AWG wire. In existing cabinets not equipped with a rectifier (such as a QCA7 cabinet powered by a QCA8 cabinet), 'daisy chain' to the TRIP connection on TS3.
 - b) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.
- 6 Cross-connect the alarm cables as shown in Figure 14-10.
 - 7 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.
 - 8 Connect the NT8D86 cables (if provided) or NT8D73 shielded network cables from the Option 51 to the connector on the faceplate of the Peripheral Buffer circuit card in the existing cabinets.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable. The NT8D73 shielded cable can be connected directly to the connector of the Peripheral Buffer card.

—OR—

If the existing cabinet is equipped to suppress EMI, the NT8D73 shielded cable should be connected to its assigned filter connector. See 553-3001-150, *Upgrade Engineering* for more information.

- 9 Remove the QPC84 Power Monitor from the QCA37 cabinet and set switch C11, position 2 to ON. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required. Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.

Note: Disregard any remaining alarm indications. Alarm indications should return to normal once the upgrade is completed and equipment that is no longer required has been removed as described later in this chapter.

- 10 Restore power to the cabinets and column by reinserting the removed fuse and resetting all circuit breakers to ON.

CAUTION

Do not remove the NT8D22 system monitor (XSM) from the column while the system is in service. Removing the XSM may cause the input circuit breakers on the existing cabinets to trip.

- 11 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

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Figure 14-9
NT8D46 cable types

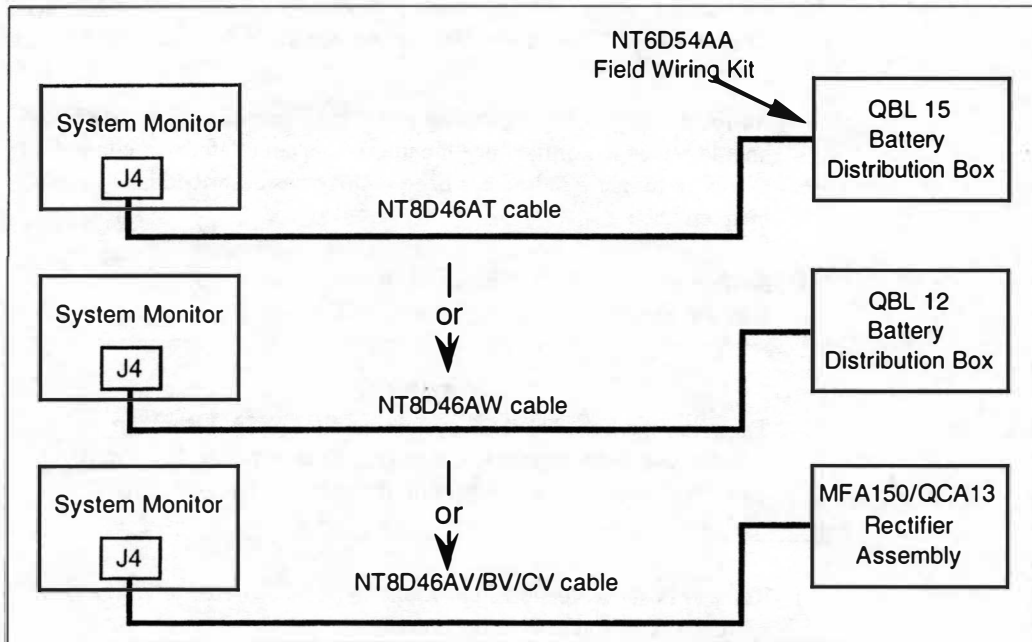
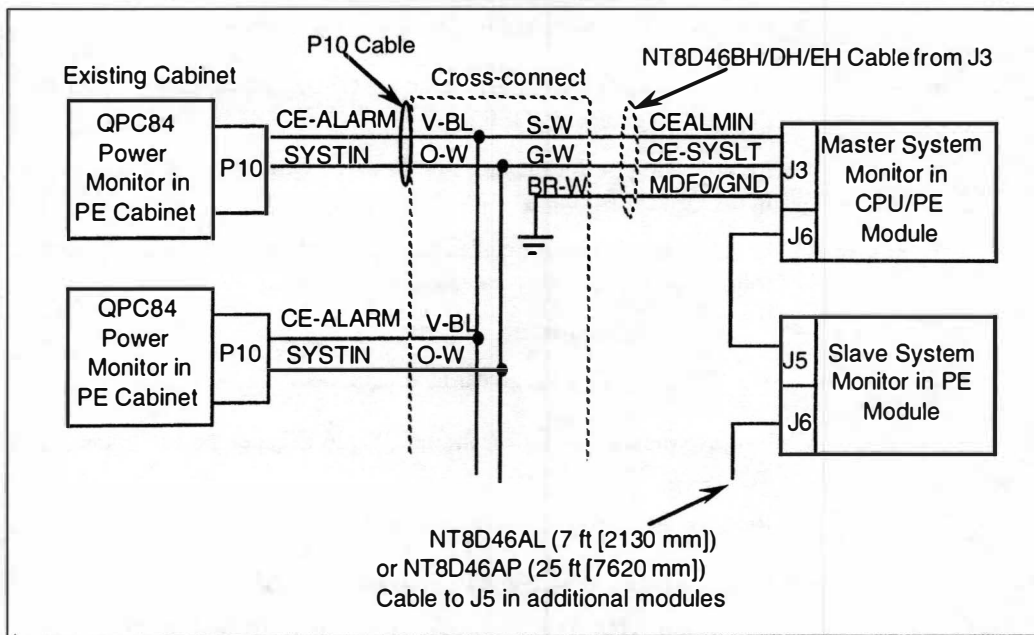


Figure 14-10
Connecting alarm cables between a cabinet and a column



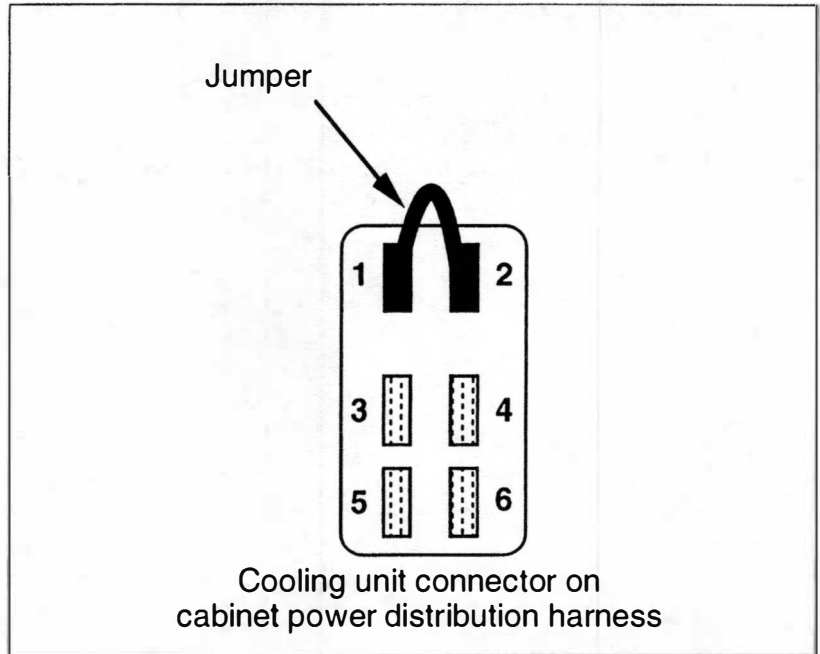
Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

Removing equipment no longer required

The following procedure describes how to remove the equipment that is no longer required once the Option 51 is operating normally.

- 1 Set the CE shelf circuit breaker on the QSD23 power control shelf in the QCA37 cabinet to OFF.
- 2 Remove the fuse for the tape unit from the QSD23 power control shelf in the QCA37 cabinet.
- 3 Disconnect and remove cables from connectors on the faceplate of the following circuit cards located on the CE shelf:
 - QPC376 network circuit cards.
 - QPC139 SDI2 circuit cards, if equipped.
- 4 Remove the circuit cards from the QSD26 CE shelf and store them in a safe place.
- 5 Remove the tape unit from the cabinet.
- 6 If you are using the CE shelf for DTI/PRI cards:
 - Install DTI/PRI cards in card slots 2, 6, 8, 10, and 12.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the CPU/Network module of the Option 51 upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breaker for the CE shelf on the QSD23 power control shelf to ON.
- 7 If you are not going to use the CE shelf for DTI/PRI cards:
 - Disconnect power connectors and alarm connectors from the QSD26 shelf. Tape all exposed power leads with electrical insulation tape.
 - Disconnect all CE alarm connectors.
 - Disconnect and remove the QUD9 cooling unit. Place a jumper (a piece of 24 or 26 AWG bare wire or a paper clip can be used) across power monitor leads 1 and 2 of the cooling unit power connector as shown in Figure 14-11. This disables the alarm for the removed cooling unit.

Figure 14-11
Cooling unit alarm connection



SL-1 QCA58 or QCA96 cabinet upgrade to Meridian 1 Option 51

This procedure is used to upgrade an SL-1 QCA58 or QCA96 cabinet (N or NT) to a Meridian 1 Option 51. To upgrade to a Meridian 1 Option 51 system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 51 is operating with the new software provided with the Option 51.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Modular upgrade of an SL-1 QCA58 or QCA96 cabinet (N or NT) to Meridian 1 Option 51

Equipment required

Table 15-2 lists minimum hardware requirements needed to upgrade a QCA58 or QCA96 cabinet to a DC powered Meridian 1 Option 51.

Table 15-2

Minimum hardware requirements for a DC Meridian 1 Option 51

Quantity	Part number	Description
1	NT6D39DC	CPU/Network Module DC
1	NT6D41AB	CE Power Supply DC
1	NT7D00BA	Top Cap DC
1	NT7D09CA	Pedestal DC
1	NT7D10CA	System Monitor Panel Assembly
1	NT7D67CA	Power Distribution Unit and filter assembly
1	NT8D17EA	Extended Conference/TDS Card
1	NT8D22AC	System Monitor
1	NT8D41AA	2 Port SDI Paddle Board
1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	NT8D46BH	System Monitor to MDF Cable
1	NT8D52DD	Pedestal Blower Unit DC
1	NT8D78AA	CPU Cable
1	NT8D80AB	MSI to MDU Cable, 2 ft (610 mm)
1	NTND08AA	ROM Card
1	NTND09CA	12 MB Memory Card
1	NTND10AA	Changeover & Memory Arbitrator Card
1	NTND16AA	4MB Multi Disk Unit (MDU)
1	QPC43R	Peripheral Signaling Card
-continued-		

Table 15-2 (continued)
Minimum hardware requirements for a DC Meridian 1 Option 51

Quantity	Part number	Description
1	NT8D84AA	XSDI to I/O panel Cable
1	NT8D93AJ	XSDI to TTY cable, 16 ft (4875 mm)
1	QPC84Q	Power Monitor
1	QPC441F	3 Port Extender Card
1	QPC579	CPU Function Card
1	QPC580C	CPU Interface Card
1	QPC584L	Mass Storage Interface Card
1	QPC477A-09	Bus Terminating Unit
1	QPC477A-10	Bus Terminating Unit
1	QPC477B-22	Bus Terminating Unit

Note: The vintages shown on circuit cards in Table 15-2 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA58 and QCA96 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 51 Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 51 to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 51 to the existing cabinet.
- A second NT8D86 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Note: The second NT8D86 cable is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as a QCA7 or 8) do not require the second NT8D86 cable since the NT8D73 cable can be connected directly to the Peripheral Buffer connector. For existing cabinets equipped to suppress EMI, refer to 553-3001-150, *Upgrade Engineering*.

Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*, in the section titled "Network to peripheral I/O cables".

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 51 system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 15-1 shows a typical QCA58 cabinet and Figure 15-2 shows a QCA58 cabinet that has been upgraded to Meridian 1 Option 51.

Figure 15-1
Typical QCA58 cabinet

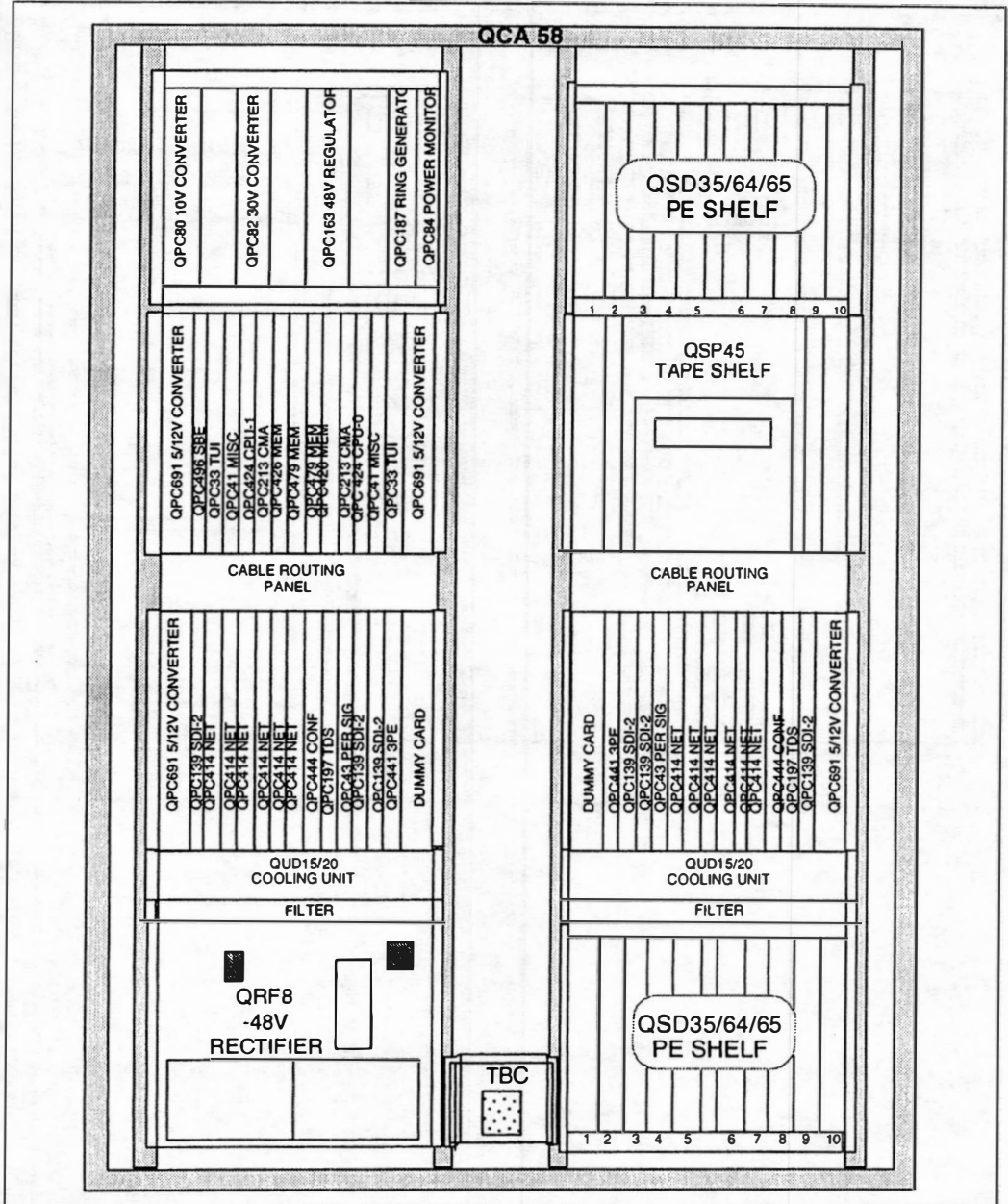
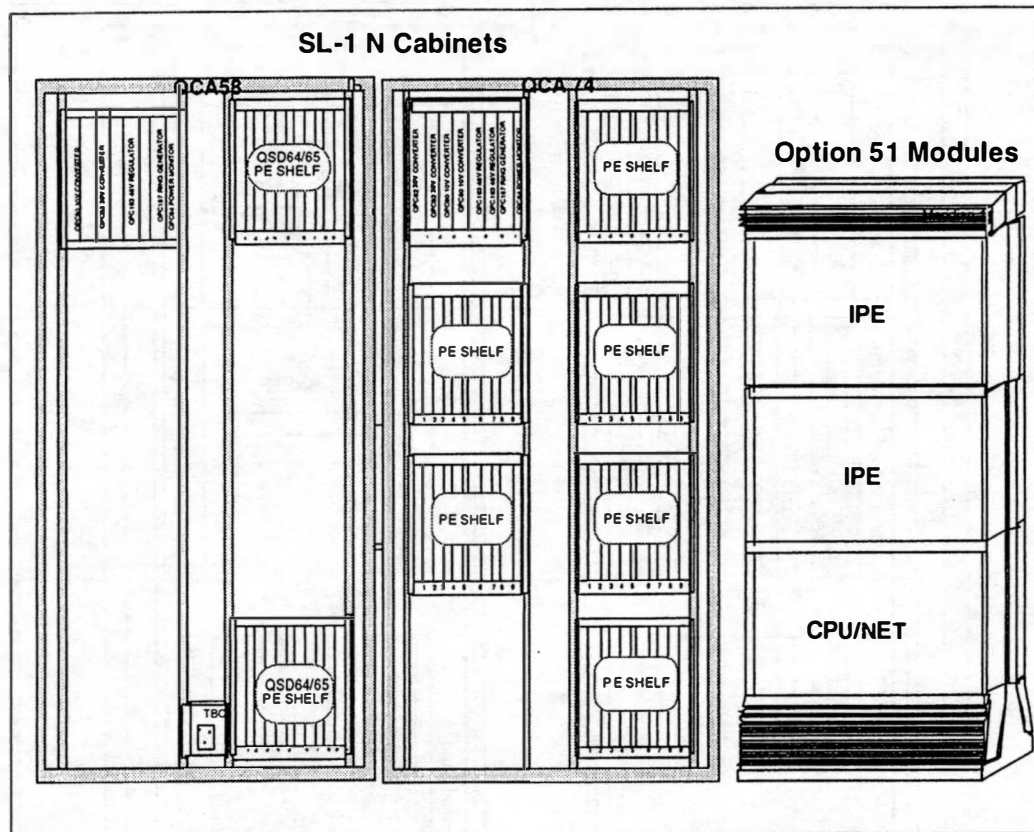


Figure 15-2
Typical QCA58 cabinet that has been upgraded to Meridian 1 Option 51



Installing the Meridian 1 Option 51 system

The Option 51 equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, CPU/Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 51 equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 15-3 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.
- Install cabling:

- Cable common equipment
- Cable network loops (within the Option 51 columns only).

Note: Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.

- Cable PE/IPE modules to the MDF and connect lines and trunks.

- Inspect Option 51 equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 15-3 shows Option 51 circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 15-3**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 15-3 (continued)
NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 15-3 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves		Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."							
For each slave, indicates the slave address		Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."							
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master			on					
	slave			off					
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

Table 15-3 (continued)

NT8D22 system monitor — settings for total number of slaves — SW2 on master

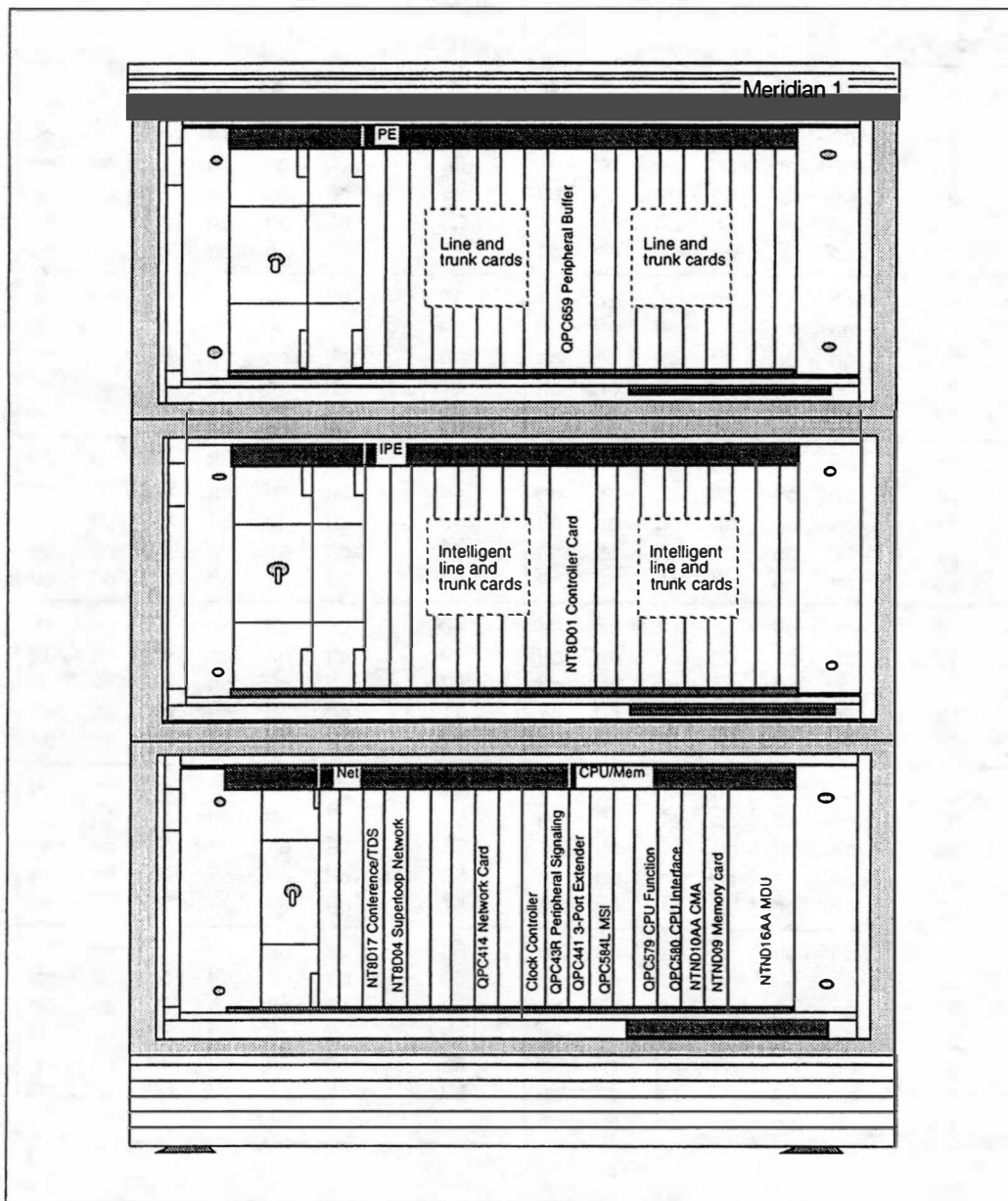
How many slave units		Switch position						How many slave units		Switch position					
		3	4	5	6	7	8			3	4	5	6	7	8
0		on	on	on	on	on	on	32		off	on	on	on	on	on
1		on	on	on	on	on	off	33		off	on	on	on	on	off
2		on	on	on	on	off	on	34		off	on	on	on	off	on
3		on	on	on	on	off	off	35		off	on	on	on	off	off
4		on	on	on	off	on	on	36		off	on	on	off	on	on
5		on	on	on	off	on	off	37		off	on	on	off	on	off
6		on	on	on	off	off	on	38		off	on	on	off	off	on
7		on	on	on	off	off	off	39		off	on	on	off	off	off
8		on	on	off	on	on	on	40		off	on	off	on	on	on
9		on	on	off	on	on	off	41		off	on	off	on	on	off
10		on	on	off	on	off	on	42		off	on	off	on	off	on
11		on	on	off	on	off	off	43		off	on	off	on	off	off
12		on	on	off	off	on	on	44		off	on	off	off	on	on
13		on	on	off	off	on	off	45		off	on	off	off	on	off
14		on	on	off	off	off	on	46		off	on	off	off	off	on
15		on	on	off	off	off	off	47		off	on	off	off	off	off
16		on	off	on	on	on	on	48		off	off	on	on	on	on
17		on	off	on	on	on	off	49		off	off	on	on	on	off
18		on	off	on	on	off	on	50		off	off	on	on	off	on
19		on	off	on	on	off	off	51		off	off	on	on	off	off
20		on	off	on	off	on	on	52		off	off	on	off	on	on
21		on	off	on	off	on	off	53		off	off	on	off	on	off
22		on	off	on	off	off	on	54		off	off	on	off	off	on
23		on	off	on	off	off	off	55		off	off	on	off	off	off
24		on	off	off	on	on	on	56		off	off	off	on	on	on
25		on	off	off	on	on	off	57		off	off	off	on	on	off
26		on	off	off	on	off	on	58		off	off	off	on	off	on
27		on	off	off	on	off	off	59		off	off	off	on	off	off
28		on	off	off	off	on	on	60		off	off	off	off	on	on
29		on	off	off	off	on	off	61		off	off	off	off	on	off
30		on	off	off	off	off	on	62		off	off	off	off	off	on
31		on	off	off	off	off	off	63		off	off	off	off	off	off
— continued —															

Table 15-3 (continued)

NT8D22 system monitor — slave address — SW2 on slave

Slave unit address	Position						Slave unit address	Position					
	3	4	5	6	7	8		3	4	5	6	7	8
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
32	off	on	on	on	on	on							

Figure 15-3
Meridian 1 Option 51 CPU/Network and IPE modules



Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 51: one designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 51, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Note: Depending on the power configuration used it may be required to do modifications to the existing cabinets. If modifications are required, do them as part of the cut-over procedures (described later in this document) to avoid unnecessary interruption of service to the end users.

Connect the DC power to the Option 51 columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 51 equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 51 module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 51 modules.

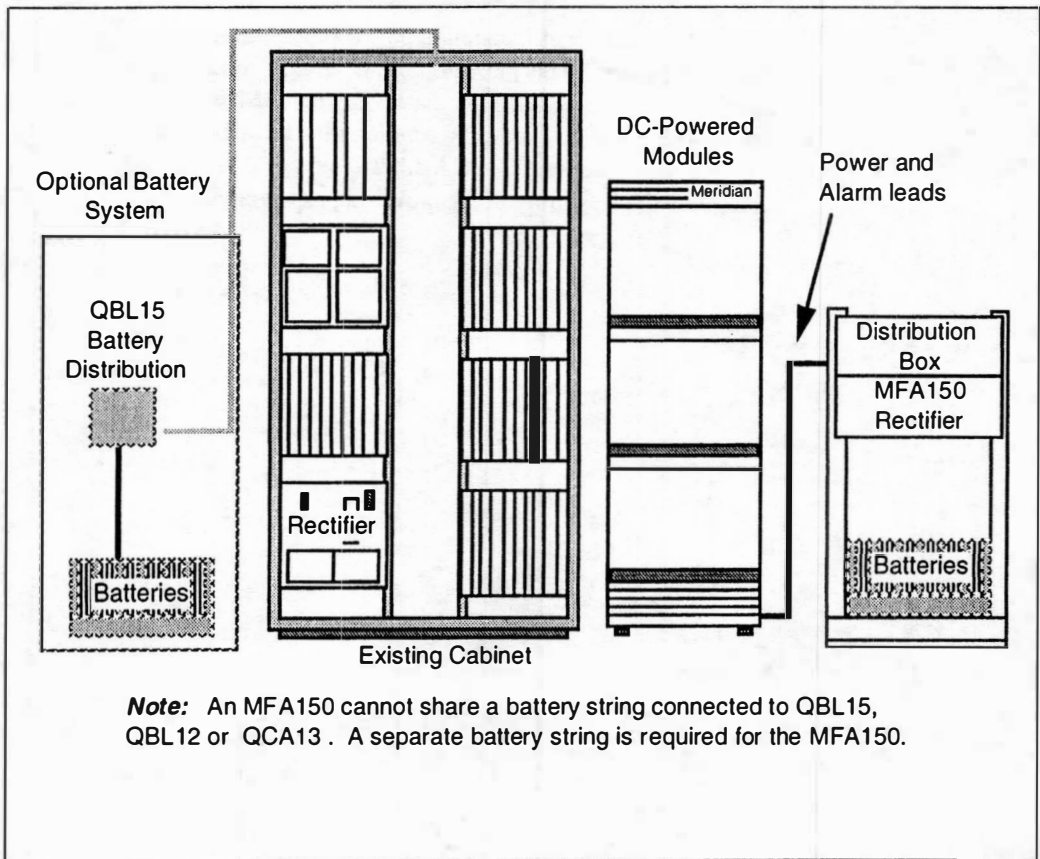
- a new power source installed in conjunction with the Option 51.

To determine the power requirements for the Option 51 system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade engineering*, "System power requirements".

Separate power source

Figure 15-4 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 51 modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 51 column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

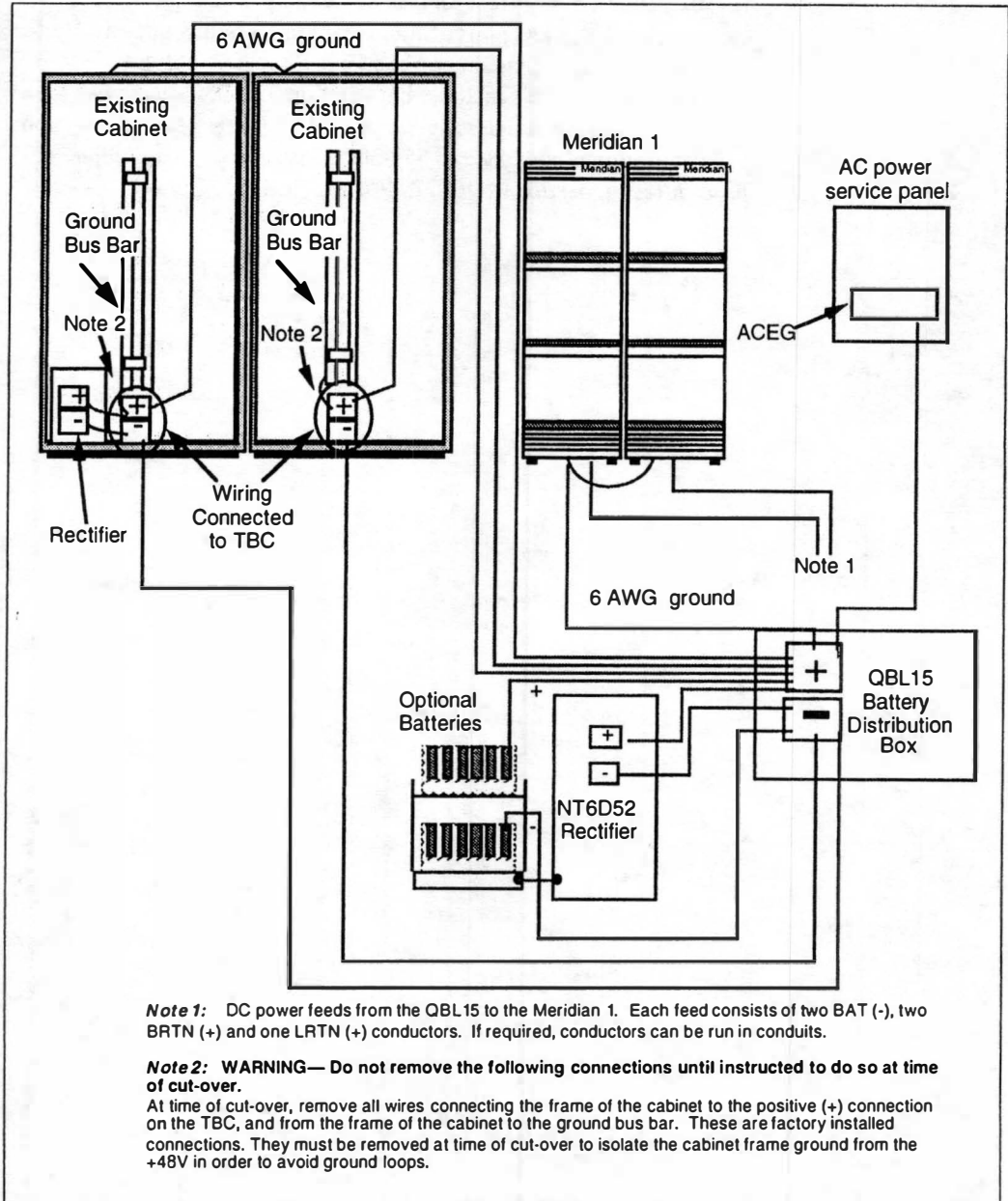
Figure 15-4
Typical arrangement of independently DC-powered Meridian 1 Option 51 modules



Common power source

Existing cabinet rectifier as a common power source

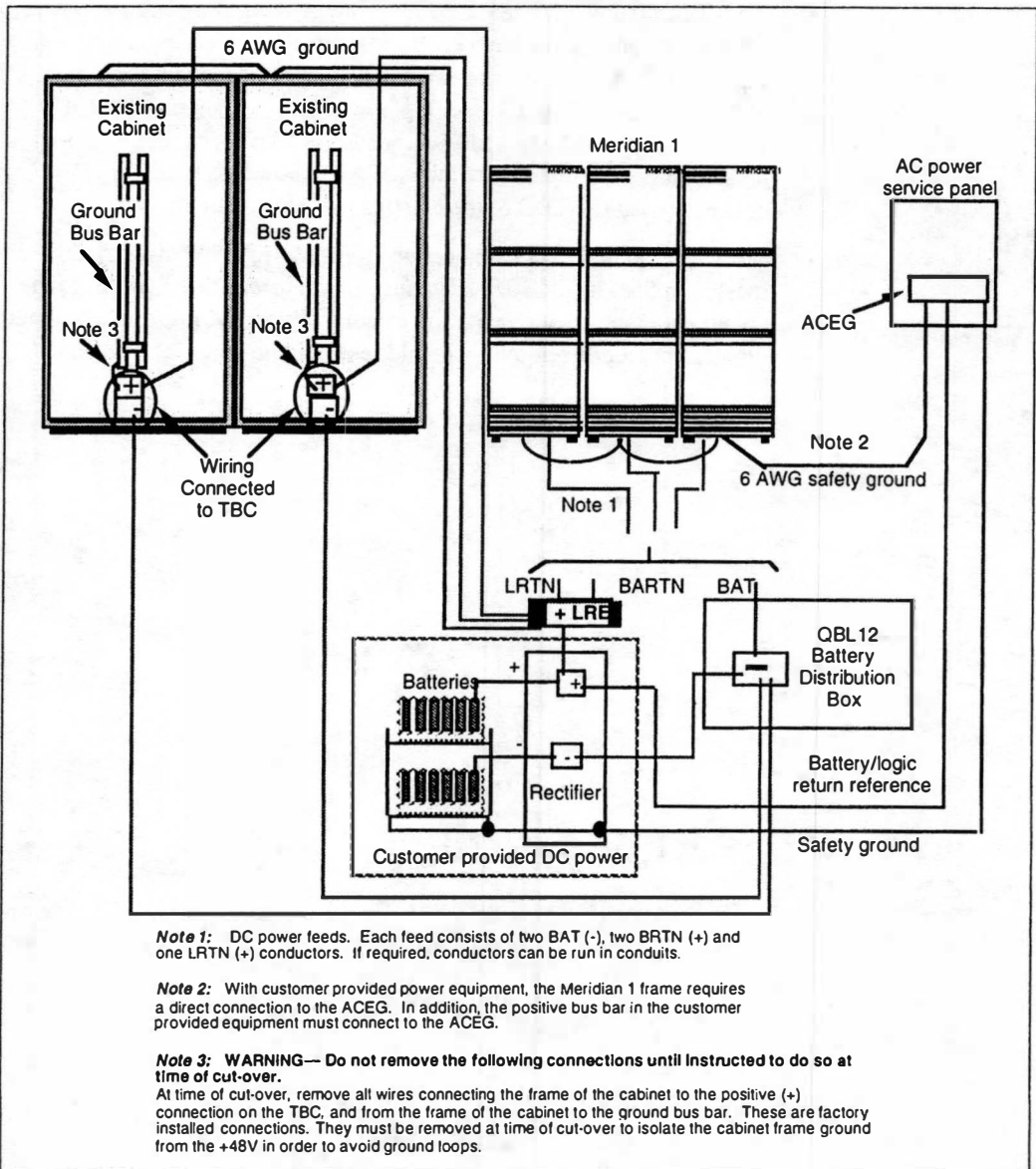
- When the existing cabinet DC power source is used as a common power source for the cabinet and the column, any QSD4 rectifier will have to be replaced with a QRF8 rectifier and the existing battery distribution box will have to be replaced with a QBL15 battery distribution box. For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 15-5 illustrates a common power supply arrangement for the upgraded system. This includes both Option 51 modules and the existing cabinet. Option 51 consists of two CPU/Network modules and an IPE module. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

Figure 15-5**Typical arrangement using a common DC power supply with optional battery backup**

Customer provided power as a common power source

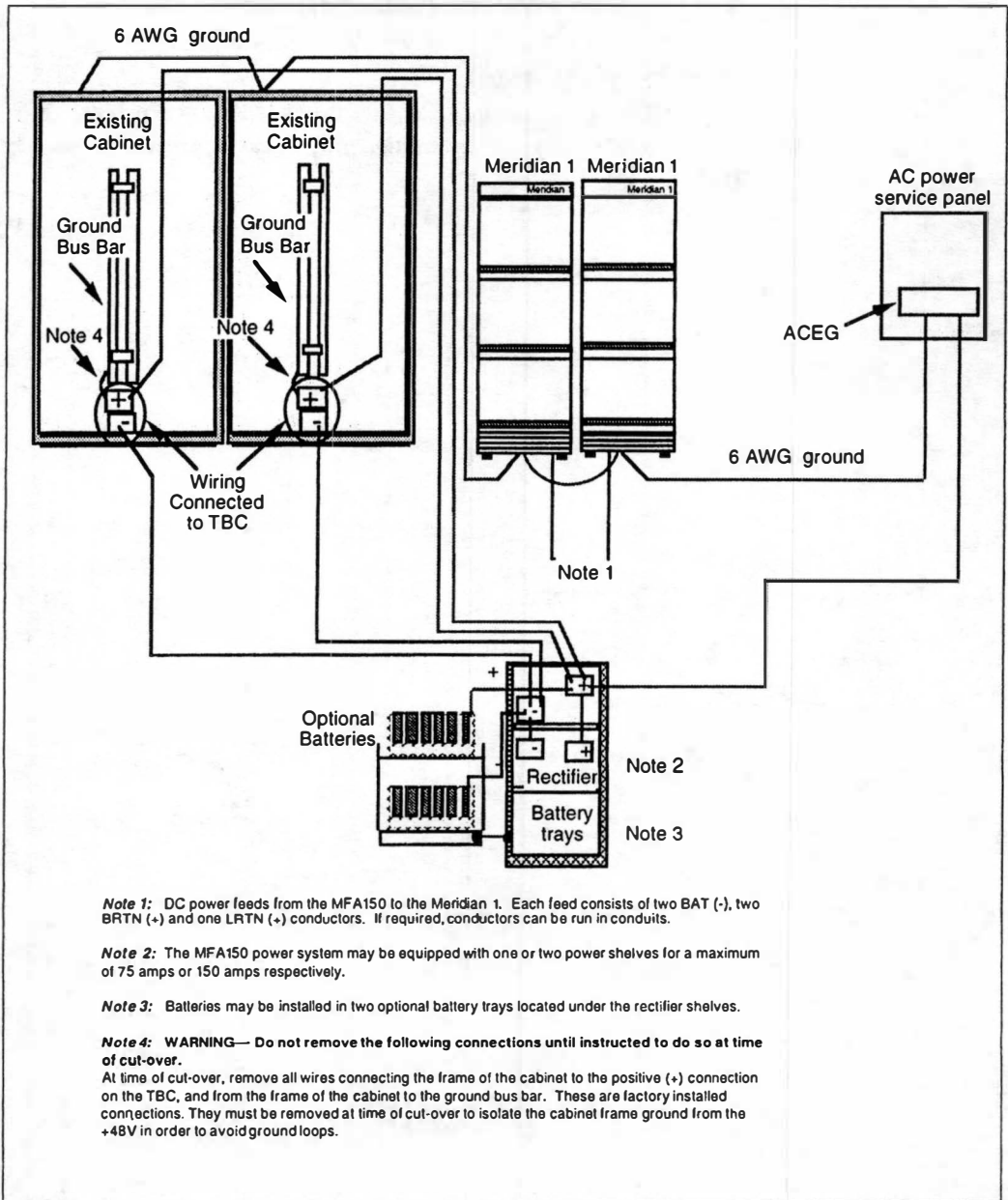
- A QBL12 Battery Distribution Box is normally used to connect to a customer provided DC power source. Figure 15-6 illustrates a customer provided common power supply arrangement for the upgraded system. This includes both Option 51 modules and the existing cabinet. A full description of QBL12 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Typical arrangement using a customer provided common DC power supply



An MFA150 power system as a common power source

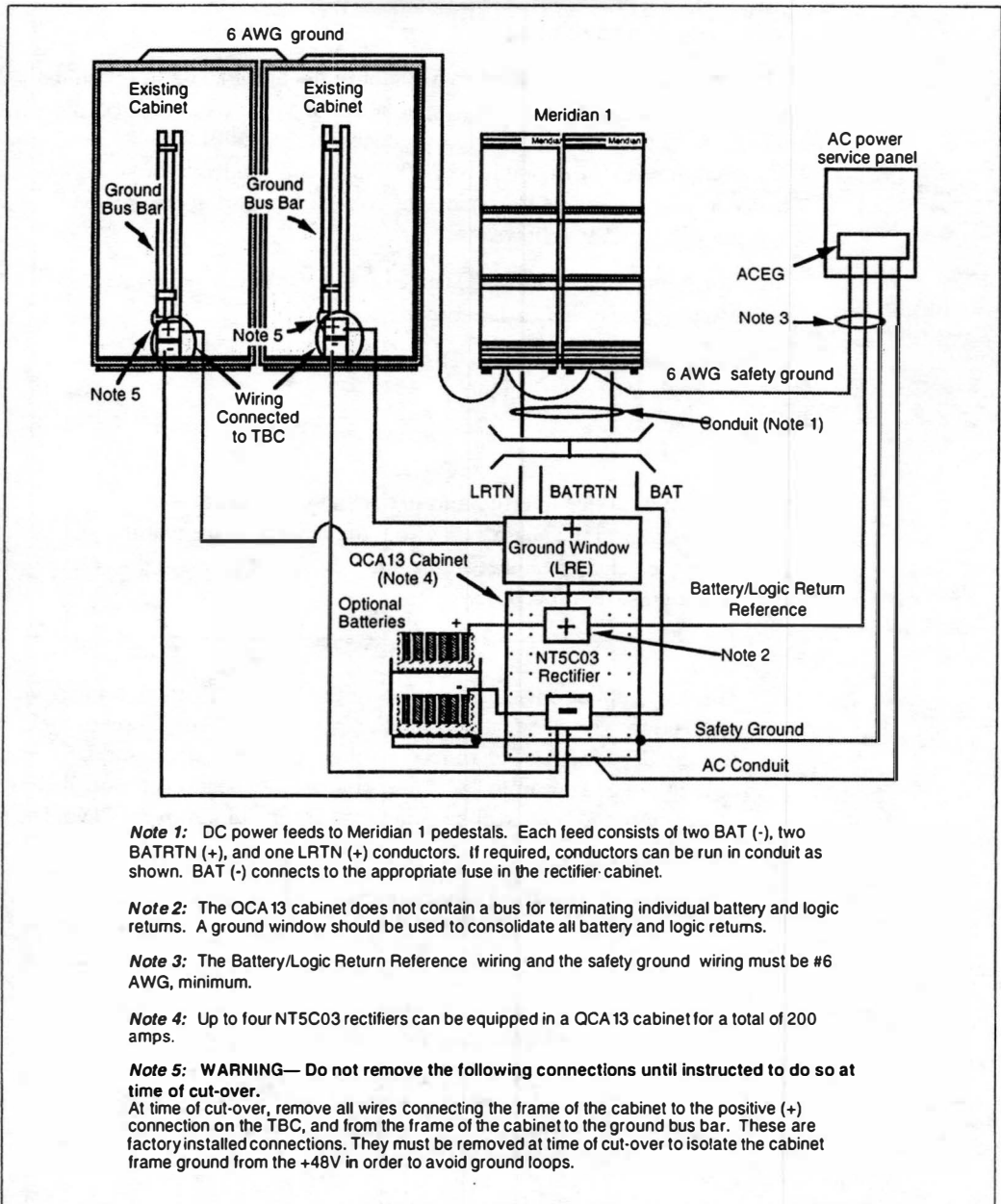
- An MFA150 power system assembly can be used as a common power source for both the Option 51 and the existing cabinets as shown in Figure 15-7. To connect the existing cabinets, disconnect the + and - 48V power leads from the existing power source, then reroute and connect them to the MFA150 power system. The connections are located under the top cover of the MFA150 power system. The connections at the TBC of the existing cabinet do not change.
- More information about connections for the MFA150 power system is located in 553-3001-210, *System installation procedures*. Refer to the documentation provided with the existing system for information about disconnecting and removing the old rectifier and batteries.

Figure 15-7**Typical arrangement using an MFA150 power system as a common power source**

An existing QCA13 power cabinet as a common power source

- A QCA13 power cabinet equipped with rectifiers can be used as a common power source for both the Option 21E and the existing cabinets as shown in Figure 1-8.
- For information about connections for the QCA13 power cabinet, refer to 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 15-7
Typical arrangement using a QCA13 as a common power source



Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 51 modules.

These cables connect the System Monitor to the SDI Paddle Board in the CPU/Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section '**Separate power source**' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 15-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 51 system:

- 1 Power up and initially load the Option 51 column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.

- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
 - 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
 - 4 The Meridian 1 Option 51 system is now operational.
-

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 51 column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 Connect an NT8D86 cable between the connector on the faceplate of the network card and the I/O panel of the Option 51. One cable is required for each network loop.
- 2 Connect an NT8D73 shielded cable, up to 30 ft (9 m) in length, to the connector on the I/O panel of the Option 51. Route the NT8D73 cable to the existing cabinet. Do not connect it to the Peripheral Buffer card in the existing cabinet at this time.

Note: Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*, in the section titled "Network to peripheral I/O cables".

- 3 If required in the existing cabinet (see Note) connect an NT8D86 cable to the connector on the NT8D73 shielded cable from the Option 51. Make sure that the connectors are locked together with the locking devices. Do not connect the cable to the faceplate of the Peripheral Buffer card at this time. It will be connected as part of the cutover procedure.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable.

Cutting-over

The following procedure describes how to cut-over to the Option 51 system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL12 or QCA13 unit**
Remove the fuses from the -48V fuse panel corresponding to each cabinet and column.
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.

Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.

- **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
- 2 If required, perform power modifications to the existing cabinets.
 - 3 In the existing cabinets, remove the wiring connecting the frame of the cabinet to the positive (+) connection of the TBC, and the wiring connecting the frame to the cabinet ground bus bar. Refer to Figures 15-5 through 15-7.

Note: This wiring was factory installed. It must be removed to avoid ground loops when existing cabinets are used with Meridian 1 modules.

- 4 This step applies only to Meridian 1 modules connected to a DC power source.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 15-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

- 5 This step applies only if a new common power source with battery backup connected to a QBL12 or QBL15 battery distribution box is to be used.

Note: This step does not apply if the common power source uses an MFA150 rectifier.

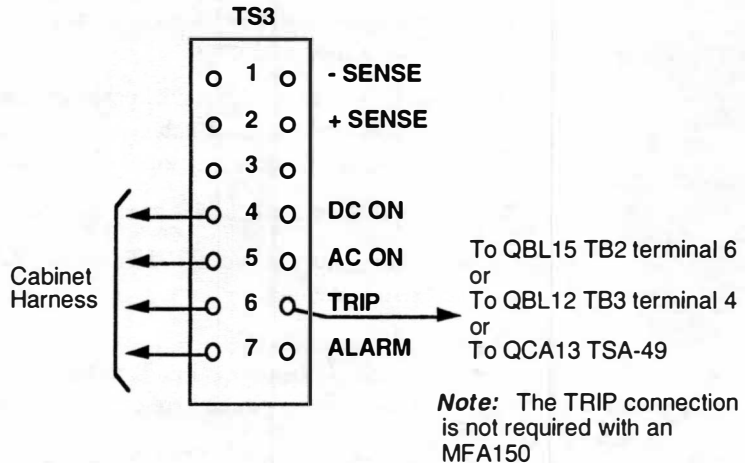
A TRIP lead must be connected to the TRIP connection on:

- the TRIP terminal on the terminal strip on the rectifier in existing cabinets equipped with a rectifier.
- the TRIP terminal of TS3 in existing cabinets not equipped with a rectifier.

The TRIP leads must be connected as follows.

If the existing rectifier is being removed from the cabinet, make the following wiring changes.

- a) If not already connected to TS3, tag and move the cabinet harness DC ON, AC ON, TRIP and ALARM leads presently connected on the rectifier to TS3 as shown in the above drawing. Depending on the type of existing cabinet, the TS3 is located either on the cabinet's TBC block, or on the QUT3 power unit.



- b) Install and connect a 16 AWG wire from terminal 6 (TRIP) on TS3 to the TRIP connection in the QBL12 or QBL15 battery distribution box or QCA13 cabinet. If there are two or more existing cabinets, "daisy chain" the TRIP connections in each cabinet with 16 AWG wire.
- c) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.

Note: The DC ON, AC ON and ALARM lead functions are performed by the Meridian 1 module. Leaving these leads connected in the existing cabinets only extends the alarm indicators to the QPC84 power monitors. If you wish, you may leave these leads disconnected. However, the TRIP lead must be connected.

If the existing rectifier is to remain in the cabinet, make the following wiring changes.

- a) Install and connect a 16 AWG wire from the TRIP connection on the terminal strip of the rectifier to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connection on the terminal strip of the rectifier in each cabinet with 16 AWG wire. In existing cabinets not equipped with a rectifier (such as a QCA7 cabinet powered by a QCA8 cabinet), 'daisy chain' to the TRIP connection on TS3.
 - b) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.
- 6 Cross-connect the alarm cables as shown in Figure 15-10.
 - 7 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.
 - 8 Connect the NT8D86 cables (if provided) or NT8D73 shielded network cables from the Option 51 to the connector on the faceplate of the Peripheral Buffer circuit card in the existing cabinets.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable. The NT8D73 shielded cable can be connected directly to the connector of the Peripheral Buffer card.

—OR—

If the existing cabinet is equipped to suppress EMI, the NT8D73 shielded cable should be connected to its assigned filter connector. See 553-3001-150, *Upgrade Engineering*, in the section titled "Network to peripheral I/O cables" for more information.

- 9 Remove the QPC84 Power Monitor from the QCA58 cabinet and set switch C11, position 2 to ON. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required. Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.

Note: Disregard any remaining alarm indications. Alarm indications should return to normal once the upgrade is completed and equipment that is no longer required has been removed as described later in this chapter.

- 10 Restore power to the cabinets and column by reinserting the removed fuse and resetting all circuit breakers to ON.

CAUTION

Do not remove the NT8D22 system monitor (XSM) from the column while the system is in service. Removing the XSM may cause the input circuit breakers on the existing cabinets to trip.

- 11 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.
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Figure 15-9
NT8D46 cable types

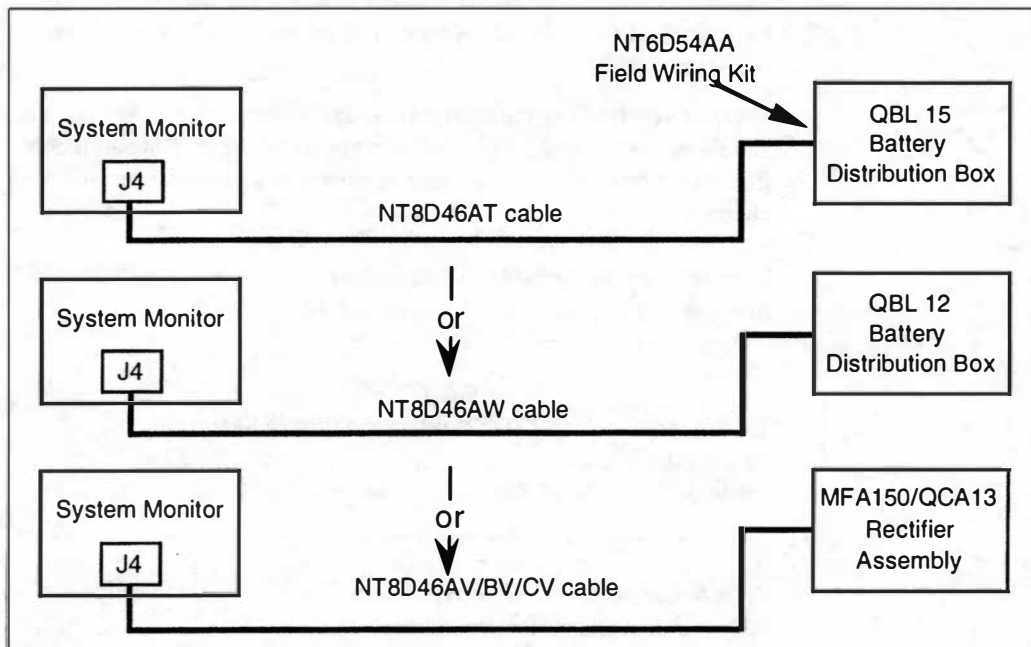
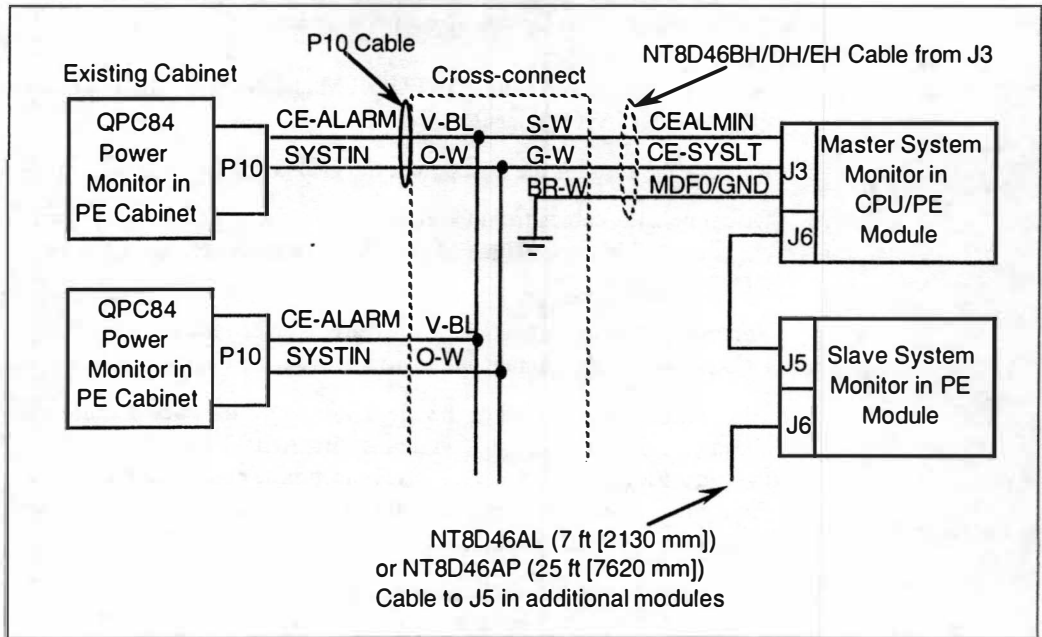


Figure 15-10
Connecting alarm cables between a cabinet and a column



Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

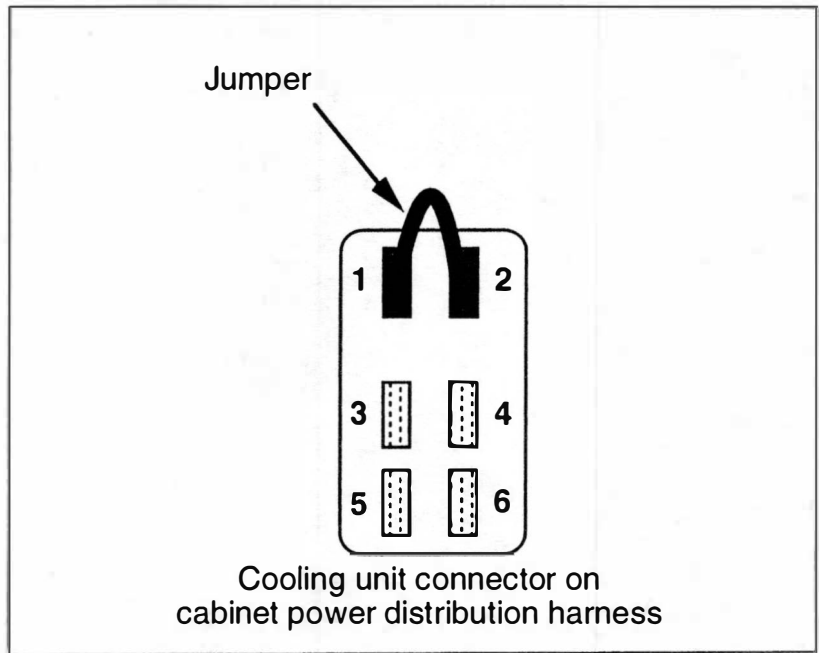
Removing equipment no longer required

The following procedure describes how to remove the equipment that is no longer required once the Option 51 is operating normally.

- 1 Set the circuit breakers for the CPU/MEM and Network shelves in the QCA58 or QCA96 cabinet to OFF.
- 2 Remove the fuse for the tape unit in the QCA58 or QCA96 cabinet.
- 3 Disconnect the cables from the faceplate connectors on all the circuit cards located in the CPU/MEM and Network shelves in the QCA58 or QCA96 cabinet.
- 4 Remove circuit cards from the CE/MEM and Network shelves in the QCA58 or QCA96 cabinet and store them in a safe place.
- 5 Disconnect the Tape Unit or the Mass Storage Unit power monitor and alarm connectors. To do this, you must first remove the Tape Unit or the Mass Storage Unit and then disconnect these connectors. Remove the tape or mass storage unit from the cabinet. Tape all exposed power leads with electrical insulation tape.
- 6 Disconnect power and alarm connections:
 - Disconnect all alarm connectors from the harness to the CPU/MEM shelf.
 - Unplug all power converter cards and all common equipment circuit cards from the CPU/MEM shelf.
 - Remove all CE cards from the Network shelves.
 - Disconnect power connections and the power monitor connector from the cabinet power distribution harness of the backplane on the QSP41 shelf.
 - Tape all exposed power leads with electrical insulation tape.
- 7 If you are using Network shelves for DTI/PRI cards:
 - Install the DTI/PRI cards in Network shelf card slots 2, 4, 6, 8, 10, and 12.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the CPU/Network module of the option 51 upgrade column to obtain clock reference for the DTI/PRI cards.
 - Set circuit breakers for the Network shelves to ON.

- 8 If you are not going to use Network shelves for DTI/PRI cards:
- Disconnect alarm connectors from the harness to Network shelves.
 - Unplug all power converter cards from each Network shelf.
 - Disconnect power connections and power monitor connector from the cabinet power distribution harness to the backplane on QSD39 and QSD40 shelves.
 - Tape all exposed power leads with electrical insulation tape.
 - Remove shelves.
 - Disconnect and remove the QUD20 cooling unit. Place a jumper (a piece of 24 or 26 AWG bare wire or a paper clip can be used) across power monitor leads 1 and 2 of the cooling unit power connector as shown in Figure 15-11 This disables the alarm for the removed cooling unit.

Figure 15-11
Cooling unit alarm connection



SL-1 QCA60 cabinet upgrade to Meridian 1 Option 51

This procedure is used to upgrade an SL-1 QCA60 cabinet (S, ST, 21, 21E) to Meridian 1 Option 51. To upgrade to a Meridian 1 Option 51 system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 51 is operating with the new software provided with the Option 51.

3) **Distributor software conversion**

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Modular upgrade of an SL-1 QCA60 cabinet (S, ST, 21, 21E) to Meridian 1 Option 51

Equipment required

Table 16-1 lists minimum hardware requirements needed to upgrade to a DC powered Meridian 1 Option 51 system.

Table 16-1

Minimum hardware requirements for a DC Meridian 1 Option 51

Quantity	Part number	Description
1	NT6D39DC	CPU/Network Module DC
1	NT6D41AB	CE Power Supply DC
1	NT7D00BA	Top Cap DC
1	NT7D09CA	Pedestal DC
1	NT7D10CA	System Monitor Panel Assembly
1	NT7D67CA	Power Distribution Unit and filter assembly
1	NT8D17EA	Extended Conference/TDS Card
1	NT8D22AC	System Monitor
1	NT8D41AA	2 Port SDI Paddle Board
1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	NT8D46BH	System Monitor to MDF Cable
1	NT8D52DD	Pedestal Blower Unit DC
1	NT8D78AA	CPU Cable
1	NT8D80AB	MSI to MDU Cable, 2 ft (610 mm)
1	NTND08AA	ROM Card
1	NTND09CA	12 MB Memory Card
1	NTND10AA	Changeover & Memory Arbitrator Card
1	NTND16AA	4MB Multi Disk Unit (MDU)
1	QPC43R	Peripheral Signaling Card
-continued-		

Table 16-1 (continued)
Minimum hardware requirements for a DC Meridian 1 Option 51

Quantity	Part number	Description
1	NT8D84AA	XSDI to I/O panel Cable
1	NT8D93AJ	XSDI to TTY cable, 16 ft (4875 mm)
1	QPC84Q	Power Monitor
1	QPC441F	3 Port Extender Card
1	QPC579	CPU Function Card
1	QPC580C	CPU Interface Card
1	QPC584L	Mass Storage Interface Card
1	QPC477A-09	Bus Terminating Unit
1	QPC477A-10	Bus Terminating Unit
1	QPC477B-22	Bus Terminating Unit

Note: The vintages shown on circuit cards in Table 16-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA60 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 51 Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 51 to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 51 to the existing cabinet.
- A second NT8D86 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Note: The second NT8D86 cable is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as a QCA7 or 8) do not require the second NT8D86 cable since the NT8D73 cable can be connected directly to the Peripheral Buffer connector. For existing cabinets equipped to suppress EMI, refer to 553-3001-150, *Upgrade Engineering*.

Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 51 system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 16-1 shows a typical QCA60 cabinet and Figure 16-2 shows a QCA60 cabinet that has been upgraded to Meridian 1 Option 51.

Figure 16-1
Typical QCA60 cabinet

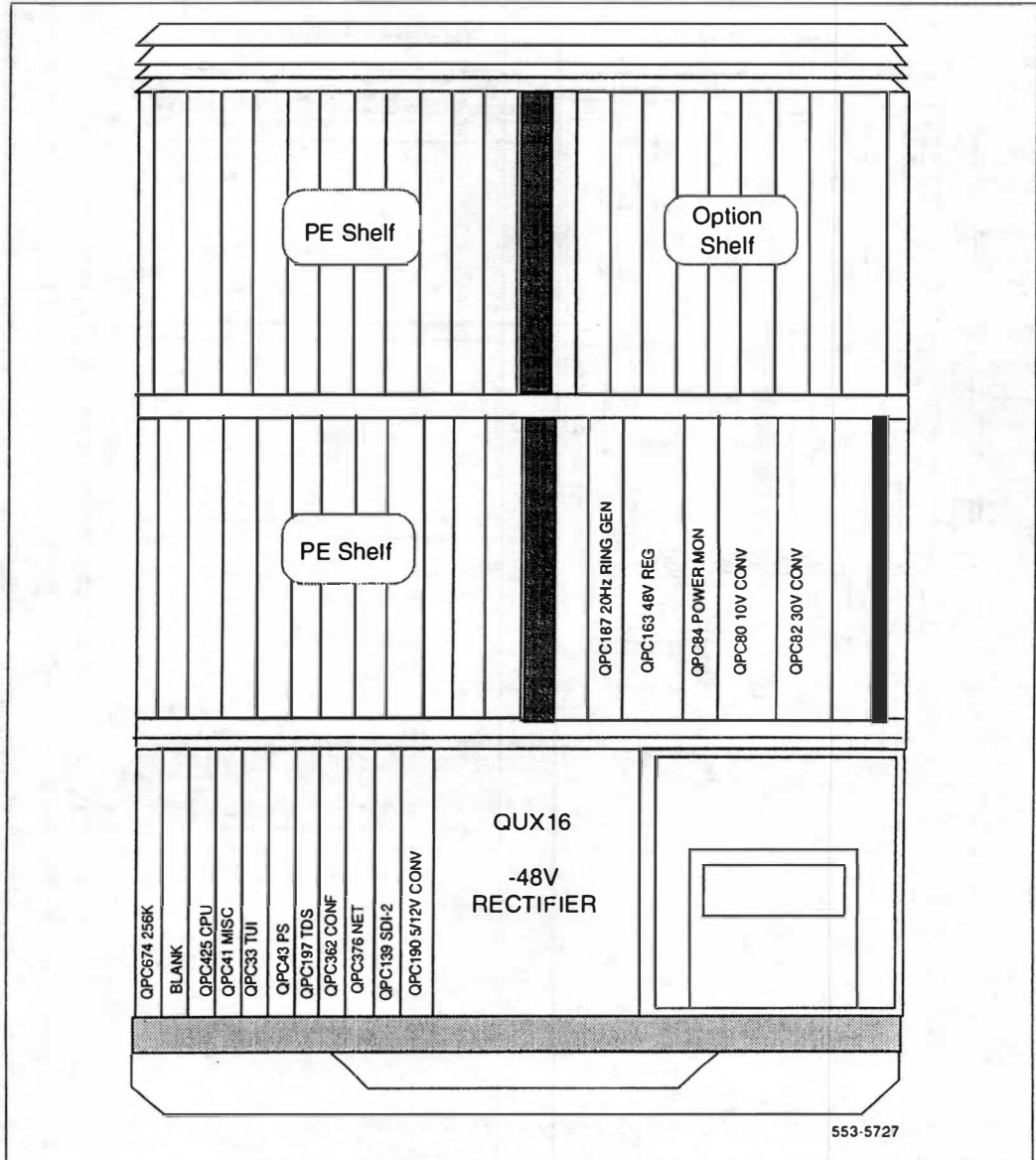
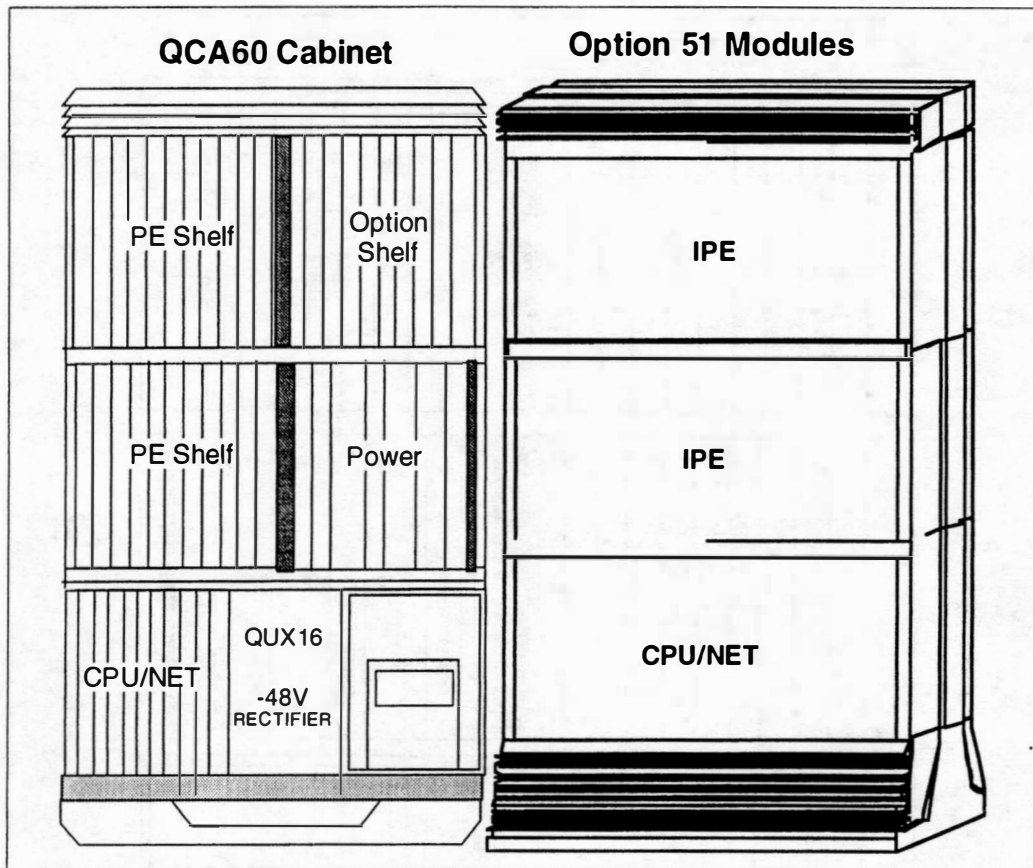


Figure 16-2

Typical QCA60 cabinet that has been upgraded to Meridian 1 Option 51



Installing the Meridian 1 Option 51 system

The Option 51 equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, CPU/Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 51 equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 16-2 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.
 - Install cabling:
 - Cable common equipment
 - Cable network loops (within the Option 51 columns only).
- Note:* Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.
- Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 51 equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 16-3 shows Option 51 circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 16-2

NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 16-2 (continued)

NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 16-2 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves		Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."							
For each slave, indicates the slave address		Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."							
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master			on					
	slave			off					
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

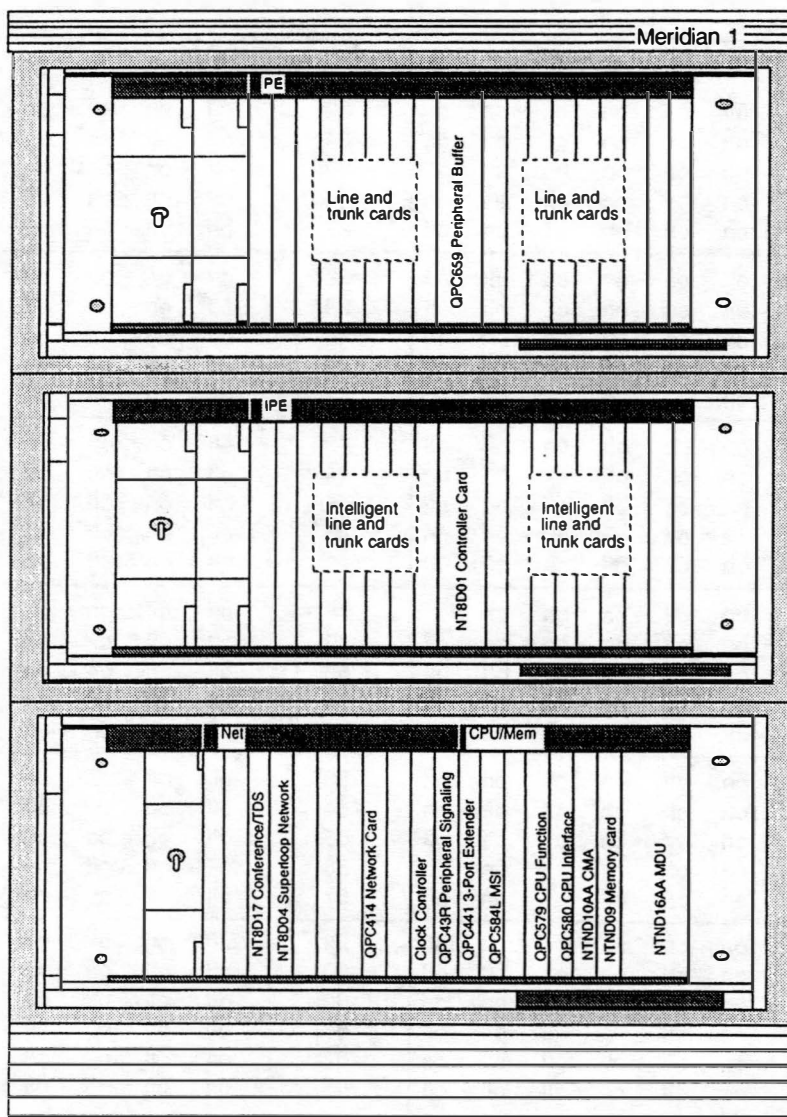
Table 16-2 (continued)
NT8D22 system monitor — settings for total number of slaves — SW2 on master

How many slave units		Switch position						How many slave units		Switch position					
		3	4	5	6	7	8			3	4	5	6	7	8
0		on	on	on	on	on	on	32		off	on	on	on	on	on
1		on	on	on	on	on	off	33		off	on	on	on	on	off
2		on	on	on	on	off	on	34		off	on	on	on	off	on
3		on	on	on	on	off	off	35		off	on	on	on	off	off
4		on	on	on	off	on	on	36		off	on	on	off	on	on
5		on	on	on	off	on	off	37		off	on	on	off	on	off
6		on	on	on	off	off	on	38		off	on	on	off	off	on
7		on	on	on	off	off	off	39		off	on	on	off	off	off
8		on	on	off	on	on	on	40		off	on	off	on	on	on
9		on	on	off	on	on	off	41		off	on	off	on	on	off
10		on	on	off	on	off	on	42		off	on	off	on	off	on
11		on	on	off	on	off	off	43		off	on	off	on	off	off
12		on	on	off	off	on	on	44		off	on	off	off	on	on
13		on	on	off	off	on	off	45		off	on	off	off	on	off
14		on	on	off	off	off	on	46		off	on	off	off	off	on
15		on	on	off	off	off	off	47		off	on	off	off	off	off
16		on	off	on	on	on	on	48		off	off	on	on	on	on
17		on	off	on	on	on	off	49		off	off	on	on	on	off
18		on	off	on	on	off	on	50		off	off	on	on	off	on
19		on	off	on	on	off	off	51		off	off	on	on	off	off
20		on	off	on	off	on	on	52		off	off	on	off	on	on
21		on	off	on	off	on	off	53		off	off	on	off	on	off
22		on	off	on	off	off	on	54		off	off	on	off	off	on
23		on	off	on	off	off	off	55		off	off	on	off	off	off
24		on	off	off	on	on	on	56		off	off	off	on	on	on
25		on	off	off	on	on	off	57		off	off	off	on	on	off
26		on	off	off	on	off	on	58		off	off	off	on	off	on
27		on	off	off	on	off	off	59		off	off	off	on	off	off
28		on	off	off	off	on	on	60		off	off	off	off	on	on
29		on	off	off	off	on	off	61		off	off	off	off	on	off
30		on	off	off	off	off	on	62		off	off	off	off	off	on
31		on	off	off	off	off	off	63		off	off	off	off	off	off
— continued —															

Table 16-2 (continued)
NT8D22 system monitor — slave address — SW2 on slave

Slave unit address							Position						
	3	4	5	6	7	8		3	4	5	6	7	8
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
32	off	on	on	on	on	on							

Figure 16-3
Meridian 1 Option 51 CPU/Network and IPE modules



Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 51: one that is designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 51, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

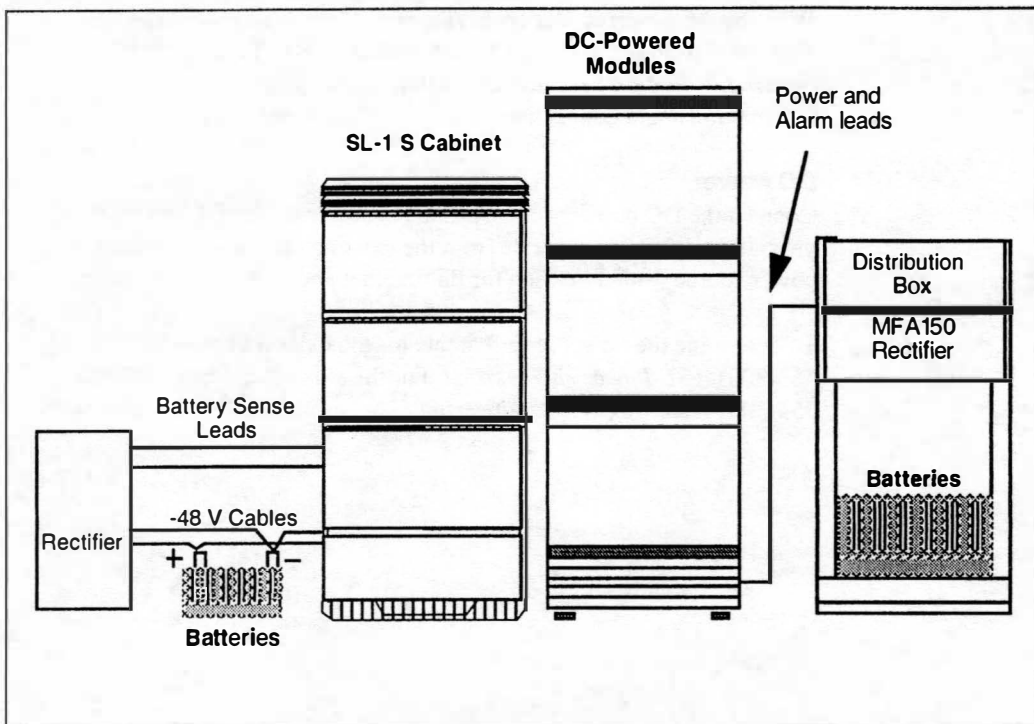
Connect the DC power to the Option 51 columns. The DC power is provided by a source separate from the existing cabinets. A common power source cannot be used for this cabinet and an Option 51 column.

To determine the power requirements for the Option 51 system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 16-4 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 51 modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 51 column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 16-4
Typical arrangement of independently DC-powered Meridian 1 Option 51 modules



Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 51 modules.

These cables connect the System Monitor to the SDI Paddle Board in the CPU/Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH /DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

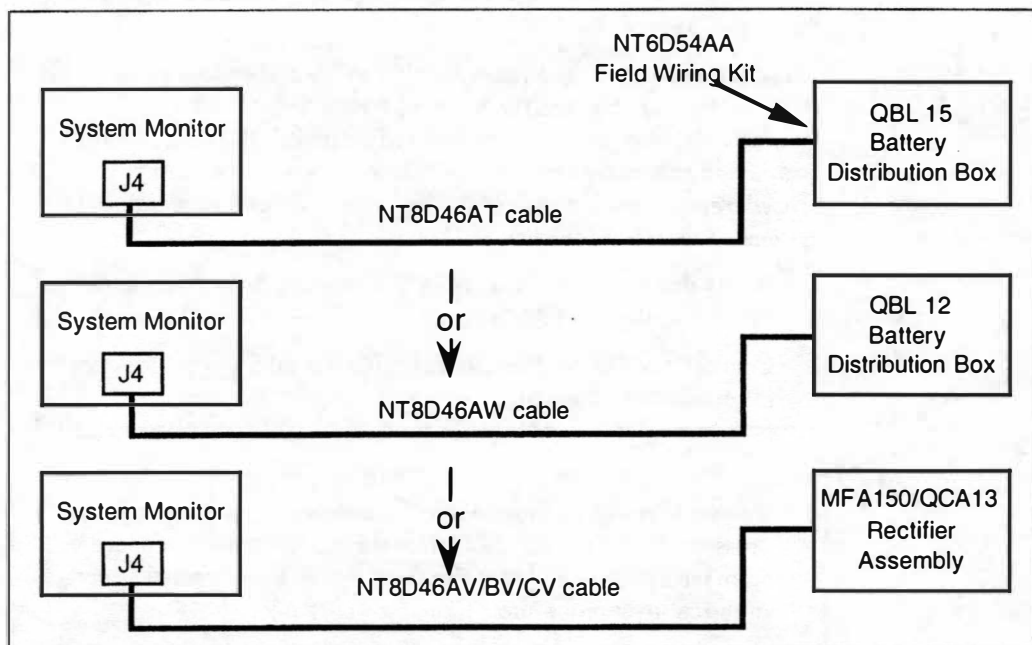
To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section '**Separate power source**' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 16-5) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Figure 16-5
NT8D46 cable types



Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 51 system:

- 1 Power up and initially load the Option 51 column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.

- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.

- 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:

- Configure network loops to match loop types and loop numbers of the existing system configuration.
- Configure I/O devices as in the existing system.
- Reenter customer data blocks. System options and features must be set as in the existing system.
- Configure station data blocks.
- Configure route data blocks.
- Configure trunk data blocks.
- Configure remaining system configuration records.
- Verify system operation before adding new equipment.
- Configure new equipment and functions, if any.

- 4 The Meridian 1 Option 51 system is now operational.
-

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 51 column.

CAUTION

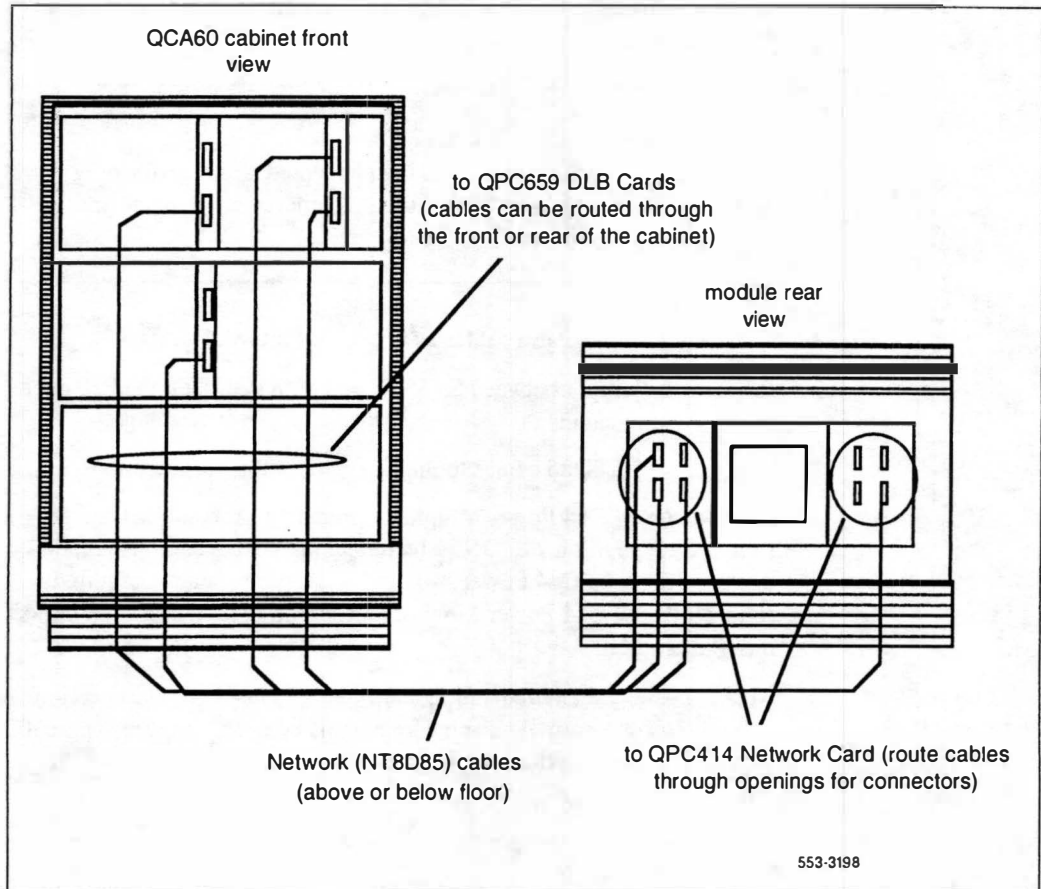
To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

Prepare the cables as follows:

- 1 Remove the rear covers from the QCA60 cabinet. See Figure 16-6 for cable routing.
 - 3 Layout a NT8DD85 cable between the QPC414 Network Card and the DLB card.
 - 4 Reinstall the covers on the QCA60 cabinet.
-

Figure 16-6
Cable types and their routing (non-EMI suppression applications)



Cutting-over

The following procedure describes how to cut-over to the Option 51 system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Cross-connect the alarm cables as shown in Figure 16-7.
- 2 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.
- 3 Connect the NT8D85 cables to the faceplate of the buffer cards.
- 4 Remove the QPC84 Power Monitor from the QCA60 cabinet and set switch C11, position 2 to ON. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required. Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.

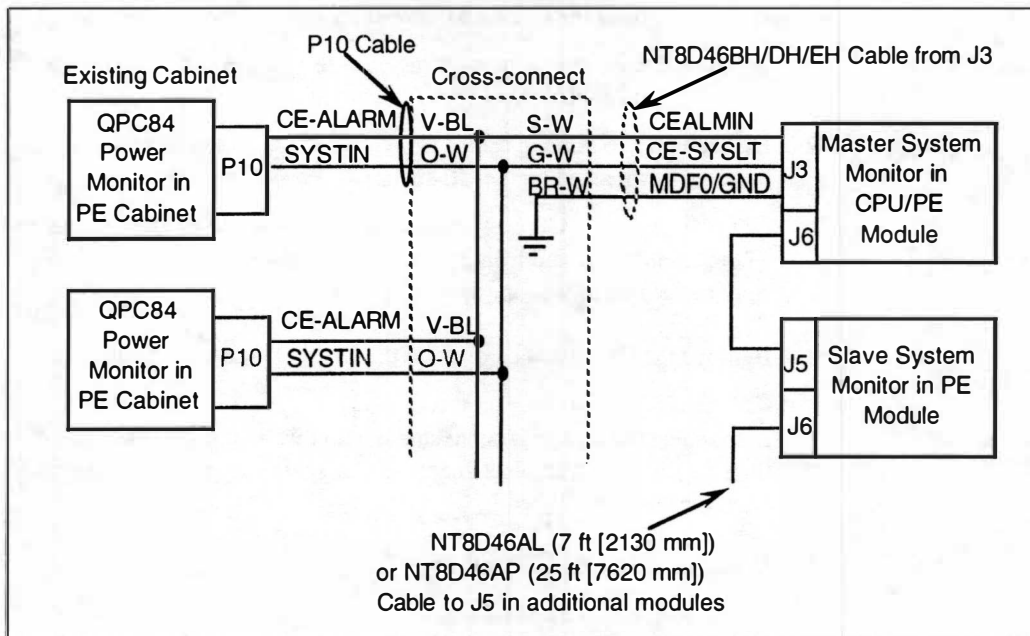
Note: Disregard any remaining alarm indications. Alarm indications should return to normal once the upgrade is completed and equipment that is no longer required has been removed as described later in this chapter.

CAUTION

Do not remove the NT8D22 system monitor (XSM) from the column while the system is in service. Removing the XSM may cause the input circuit breakers on the existing cabinets to trip.

- 5 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Figure 16-7
Connecting alarm cables between a cabinet and a column



Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

Removing equipment no longer required

The following procedure describes how to remove the equipment that is no longer required once the Option 51 is operating normally.

- 1 Set the CE shelf circuit breaker labeled CB1 on the power control shelf in the QCA60 cabinet to OFF.
- 2 Disconnect and remove cables from connectors on the faceplate of the circuit cards located on the CE shelf.

Note: The main CE shelf is located at the bottom left shelf position in the cabinet (viewed from the front). An optional expansion CE shelf may be located at the top right shelf position.

- 3 Remove the CE circuit cards from the CE shelf and store them in a safe place.
 - 4 Disconnect the tape unit connector. To do this, you must first remove the tape unit and then disconnect the connector. Remove the tape unit from the cabinet.
 - 5 If you are using the CE shelf for DTI/PRI cards:
 - Install the DTI/PRI cards.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the CPU module of the option 21E upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breaker for the CE shelf on the power control shelf to ON.
 - 6 If you are not going to use the CE shelf for DTI/PRI cards unplug and remove the remaining cards from the CE shelf.
-

SL-1 QCA109 cabinet upgrade to Meridian 1 Option 51

This procedure is used to upgrade an SL-1 QCA109 cabinet (MS, ST, 21 or 21E) to a Meridian 1 Option 51. To upgrade to a Meridian 1 Option 51 system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 51 is operating with the new software provided with the Option 51.

3) **Distributor software conversion**

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Modular upgrade of an SL-1 QCA109 cabinet (MS, ST, 21 or 21E) to Meridian 1 Option 51

Equipment required

Table 17-1 lists minimum hardware requirements needed to upgrade an SL-1 MS system to a DC powered Meridian 1 Option 51 system.

Table 17-1

Minimum hardware requirements for a DC Meridian 1 Option 51

Quantity	Part number	Description
1	NT6D39DC	CPU/Network Module DC
1	NT6D41AB	CE Power Supply DC
1	NT7D00BA	Top Cap DC
1	NT7D09CA	Pedestal DC
1	NT7D10CA	System Monitor Panel Assembly
1	NT7D67CA	Power Distribution Unit and filter assembly
1	NT8D17EA	Extended Conference/TDS Card
1	NT8D22AC	System Monitor
1	NT8D41AA	2 Port SDI Paddle Board
1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	NT8D46BH	System Monitor to MDF Cable
1	NT8D52DD	Pedestal Blower Unit DC
1	NT8D78AA	CPU Cable
1	NT8D80AB	MSI to MDU Cable, 2 ft (610 mm)
1	NTND08AA	ROM Card
1	NTND09CA	12 MB Memory Card
1	NTND10AA	Changeover & Memory Arbitrator Card
1	NTND16AA	4MB Multi Disk Unit (MDU)
1	QPC43R	Peripheral Signaling Card
-continued-		

Table 17-1 (continued)
Minimum hardware requirements for a DC Meridian 1 Option 51

Quantity	Part number	Description
1	NT8D84AA	XSDI to I/O panel Cable
1	NT8D93AJ	XSDI to TTY cable, 16 ft (4875 mm)
1	QPC84Q	Power Monitor
1	QPC441F	3 Port Extender Card
1	QPC579	CPU Function Card
1	QPC580C	CPU Interface Card
1	QPC584L	Mass Storage Interface Card
1	QPC477A-09	Bus Terminating Unit
1	QPC477A-10	Bus Terminating Unit
1	QPC477B-22	Bus Terminating Unit

Note: The vintages shown on circuit cards in Table 17-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA109 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 51 Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 51 to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 51 to the existing cabinet.
- A second NT8D86 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Note: The second NT8D86 cable is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as a QCA7 or 8) do not require the second NT8D86 cable since the NT8D73 cable can be connected directly to the Peripheral Buffer connector. For existing cabinets equipped to suppress EMI, refer to 553-3001-150, *Upgrade Engineering*.

Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 51 system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 17-1 shows a typical QCA109 cabinet and Figure 17-2 shows a QCA109 cabinet that has been upgraded to Meridian 1 Option 51.

Figure 17-1
Typical QCA109 cabinet

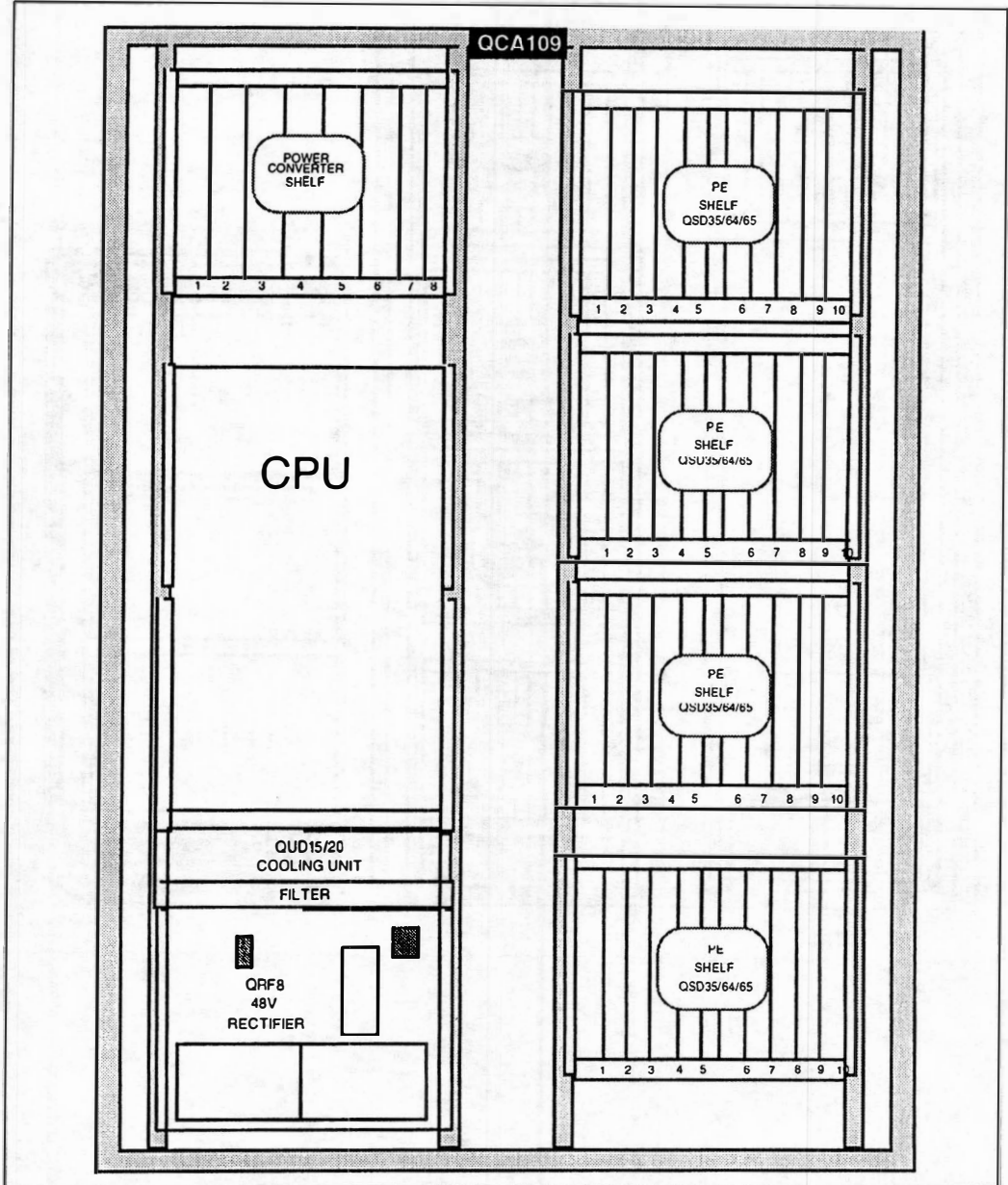
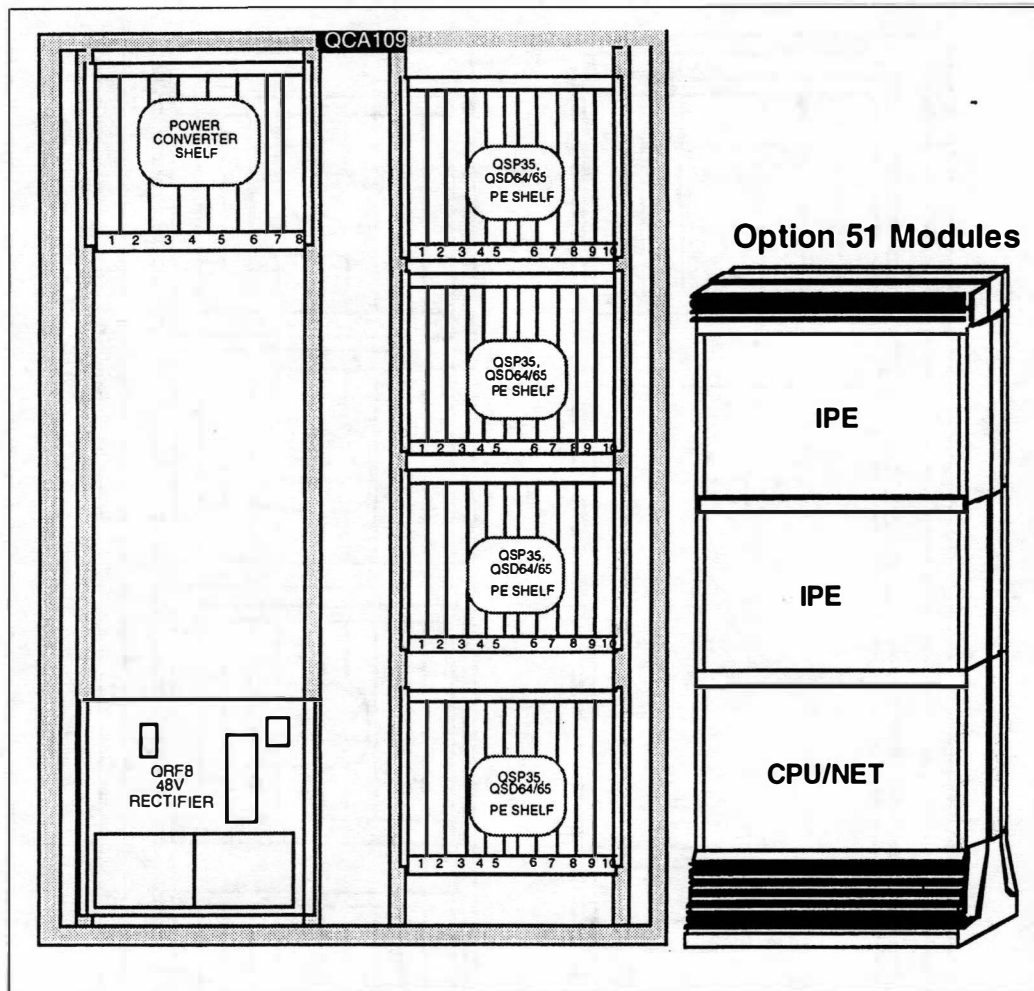


Figure 17-2
Typical QCA109 cabinet that has been upgraded to Meridian 1 Option 51



Installing the Meridian 1 Option 51 system

The Option 51 equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, CPU/Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 51 equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 17-2 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.
 - Install cabling:
 - Cable common equipment
 - Cable network loops (within the Option 51 columns only).
- Note:* Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.
- Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 51 equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 17-3 shows Option 51 circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 17-2**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 17-2 (continued)**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 17-2 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves				Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."					
For each slave, indicates the slave address				Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."					
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master			on					
	slave			off					
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

Table 17-2 (continued)

NT8D22 system monitor — settings for total number of slaves — SW2 on master

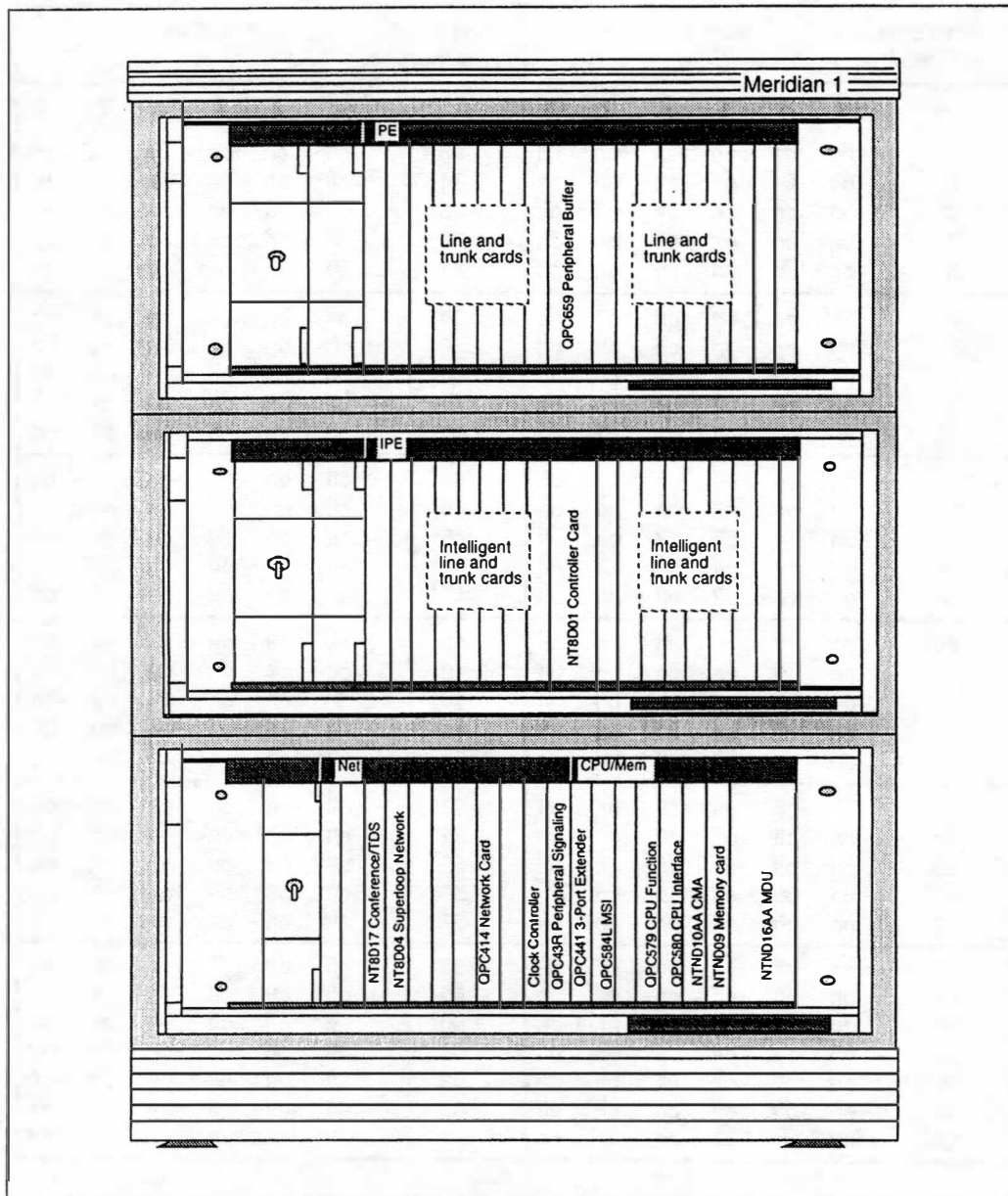
How many slave units	Switch position						How many slave units	Switch position					
	3	4	5	6	7	8		3	4	5	6	7	8
0	on	on	on	on	on	on	32	off	on	on	on	on	on
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
— continued —													

Table 17-2 (continued)

NT8D22 system monitor — slave address — SW2 on slave

Slave unit address							Position							Slave unit address							Position						
							3	4	5	6	7	8								3	4	5	6	7	8		
1	on	on	on	on	on	off	33	off	on	on	on	on	on	off	33	off	on	on	on	on	off	on					
2	on	on	on	on	off	on	34	off	on	on	on	on	off	on	34	off	on	on	on	off	on						
3	on	on	on	on	off	off	35	off	on	on	on	on	off	off	35	off	on	on	on	off	off						
4	on	on	on	off	on	on	36	off	on	on	off	on	on	on	36	off	on	on	off	on	on						
5	on	on	on	off	on	off	37	off	on	on	off	on	off	on	37	off	on	on	off	on	off						
6	on	on	on	off	off	on	38	off	on	on	off	off	on	on	38	off	on	on	off	off	on						
7	on	on	on	off	off	off	39	off	on	on	off	off	off	off	39	off	on	on	off	off	off						
8	on	on	off	on	on	on	40	off	on	off	on	on	on	on	40	off	on	off	on	on	on						
9	on	on	off	on	on	off	41	off	on	off	on	on	off	on	41	off	on	off	on	on	off						
10	on	on	off	on	off	on	42	off	on	off	on	off	on	on	42	off	on	off	on	off	on						
11	on	on	off	on	off	off	43	off	on	off	on	off	off	off	43	off	on	off	on	off	off						
12	on	on	off	off	on	on	44	off	on	off	off	off	on	on	44	off	on	off	off	on	on						
13	on	on	off	off	on	off	45	off	on	off	off	off	on	off	45	off	on	off	off	on	off						
14	on	on	off	off	off	on	46	off	on	off	off	off	off	on	46	off	on	off	off	off	on						
15	on	on	off	off	off	off	47	off	on	off	off	off	off	off	47	off	on	off	off	off	off						
16	on	off	on	on	on	on	48	off	off	on	on	on	on	on	48	off	off	on	on	on	on						
17	on	off	on	on	on	off	49	off	off	on	on	on	off	on	49	off	off	on	on	on	off						
18	on	off	on	on	off	on	50	off	off	on	on	off	on	on	50	off	off	on	on	off	on						
19	on	off	on	on	off	off	51	off	off	on	on	off	off	on	51	off	off	on	on	off	off						
20	on	off	on	off	on	on	52	off	off	on	off	on	on	on	52	off	off	on	off	on	on						
21	on	off	on	off	on	off	53	off	off	on	off	on	off	on	53	off	off	on	off	on	off						
22	on	off	on	off	off	on	54	off	off	on	off	off	on	on	54	off	off	on	off	off	on						
23	on	off	on	off	off	off	55	off	off	on	off	off	off	on	55	off	off	on	off	off	off						
24	on	off	off	on	on	on	56	off	off	off	on	on	on	on	56	off	off	off	on	on	on						
25	on	off	off	on	on	off	57	off	off	off	on	on	off	on	57	off	off	off	on	on	off						
26	on	off	off	on	off	on	58	off	off	off	on	off	on	on	58	off	off	off	on	off	on						
27	on	off	off	on	off	off	59	off	off	off	on	off	off	on	59	off	off	off	on	off	off						
28	on	off	off	off	on	on	60	off	off	off	off	on	on	on	60	off	off	off	off	on	on						
29	on	off	off	off	on	off	61	off	off	off	off	on	off	on	61	off	off	off	off	on	off						
30	on	off	off	off	off	on	62	off	off	off	off	off	on	on	62	off	off	off	off	off	on						
31	on	off	off	off	off	off	63	off	off	off	off	off	off	on	63	off	off	off	off	off	off						
32	off	on	on	on	on	on																					

Figure 17-3
Meridian 1 Option 51 CPU/Network and IPE modules



Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 51: one designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 51, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Note: Depending on the power configuration used it may be required to do modifications to the existing cabinets. If modifications are required, do them as part of the cut-over procedures (described later in this document) to avoid unnecessary interruption of service to the end users.

Connect the DC power to the Option 51 columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

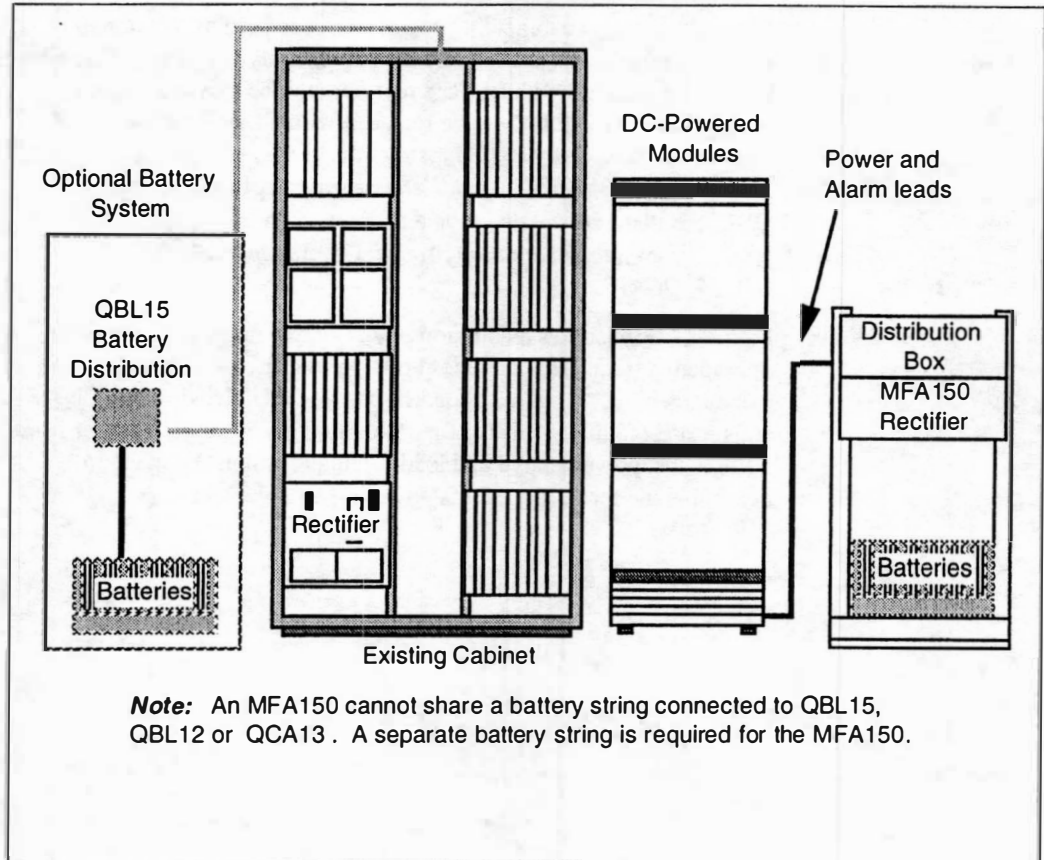
- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 51 equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 51 module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 51 modules.

- a new power source installed in conjunction with the Option 51.

To determine the power requirements for the Option 51 system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

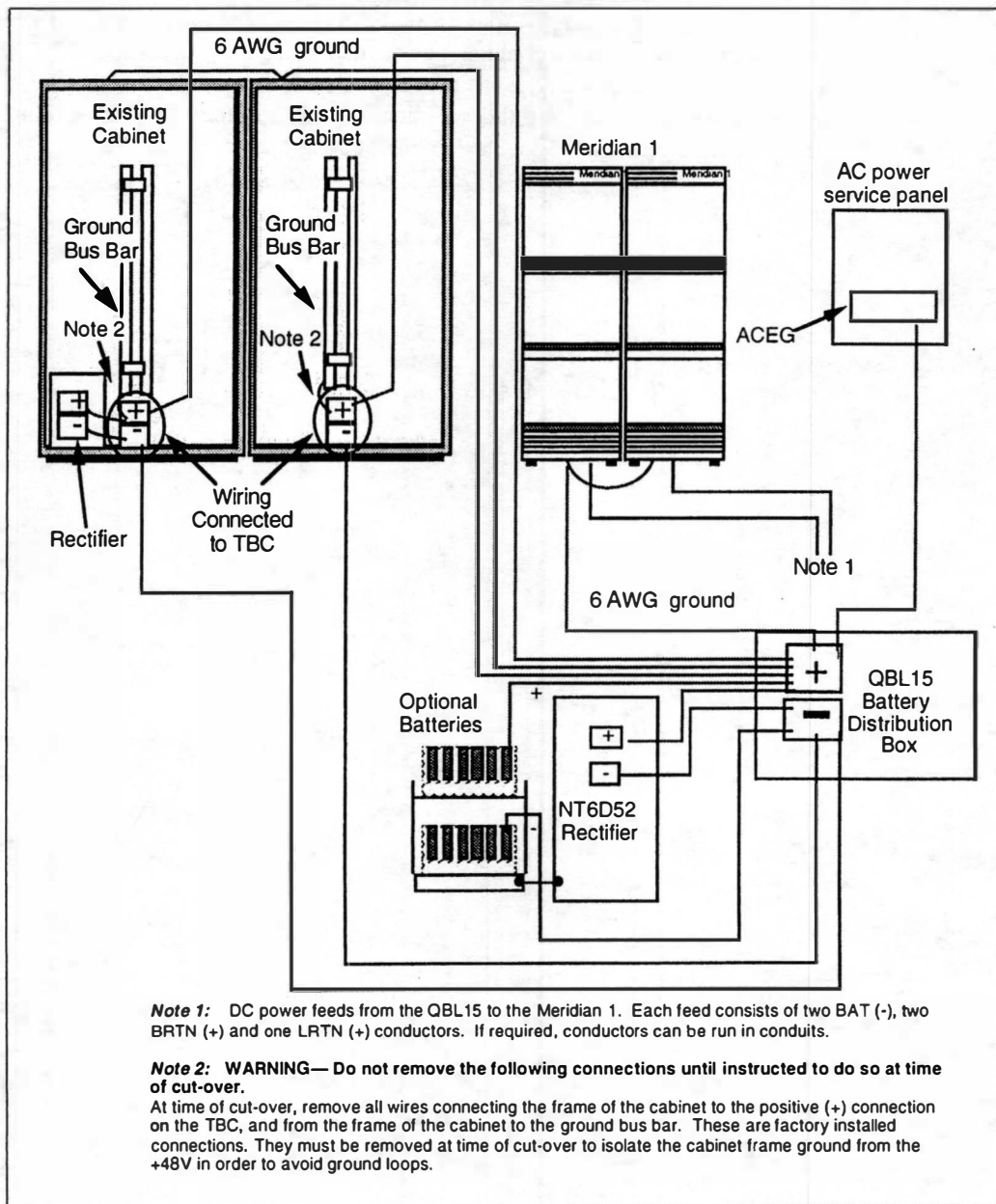
Figure 17-4 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 51 modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 51 column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 17-4**Typical arrangement of independently DC-powered Meridian 1 Option 51 modules**

Common power source

Existing cabinet rectifier as a common power source

- When the existing cabinet DC power source is used as a common power source for the cabinet and the column, any QSD4 rectifier will have to be replaced with a QRF8 rectifier and the existing battery distribution box will have to be replaced with a QBL15 battery distribution box. For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 17-5 illustrates a common power supply arrangement for the upgraded system. This includes both Option 51 modules and the existing cabinet. Option 51 consists of two CPU/Network modules and an IPE module. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

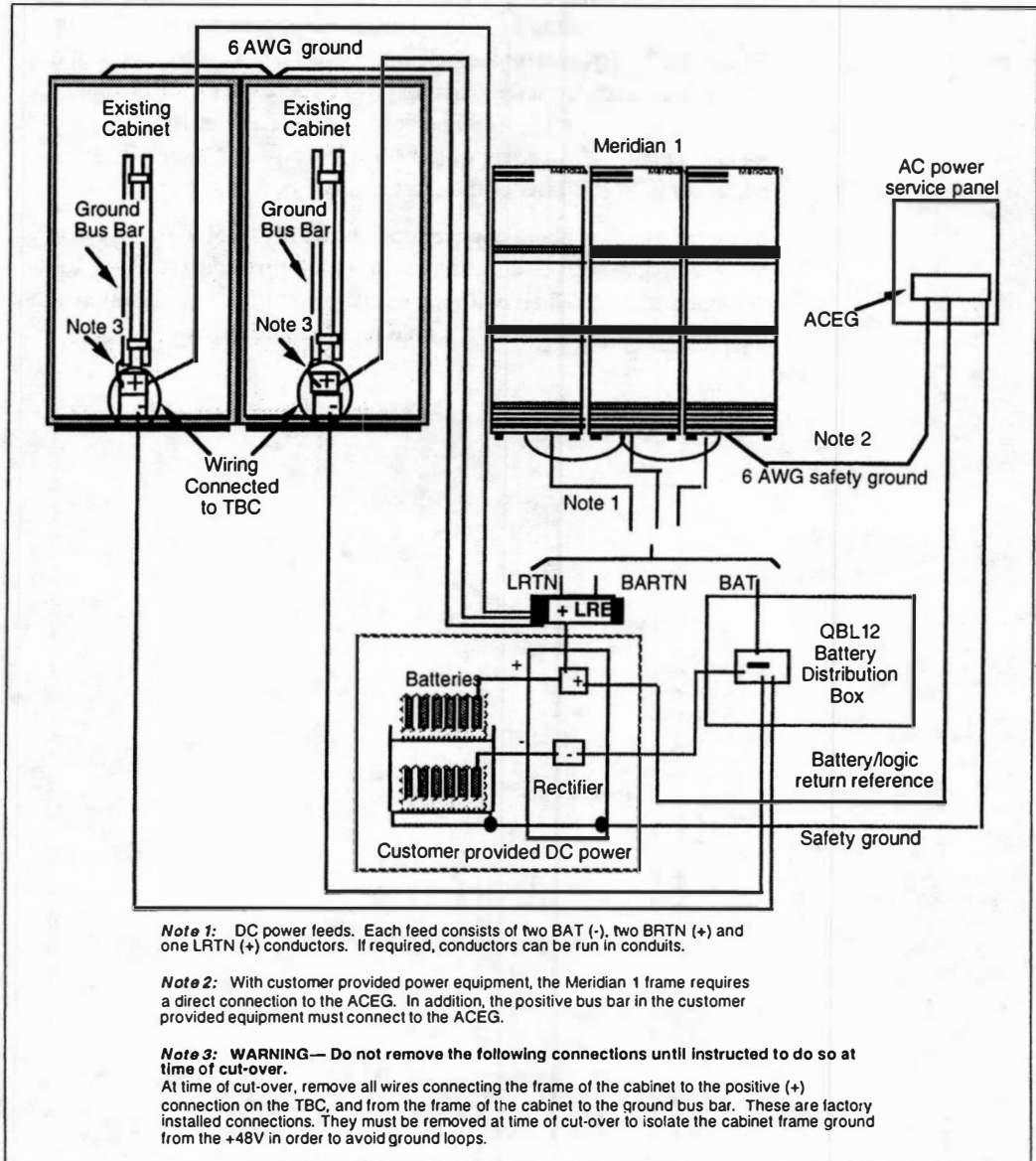
Figure 17-5**Typical arrangement using a common DC power supply with optional battery backup**

Customer provided power as a common power source

- A QBL12 Battery Distribution Box is normally used to connect to a customer provided DC power source. Figure 17-6 illustrates a customer provided common power supply arrangement for the upgraded system. This includes both Option 51 modules and the existing cabinet. A full description of QBL12 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

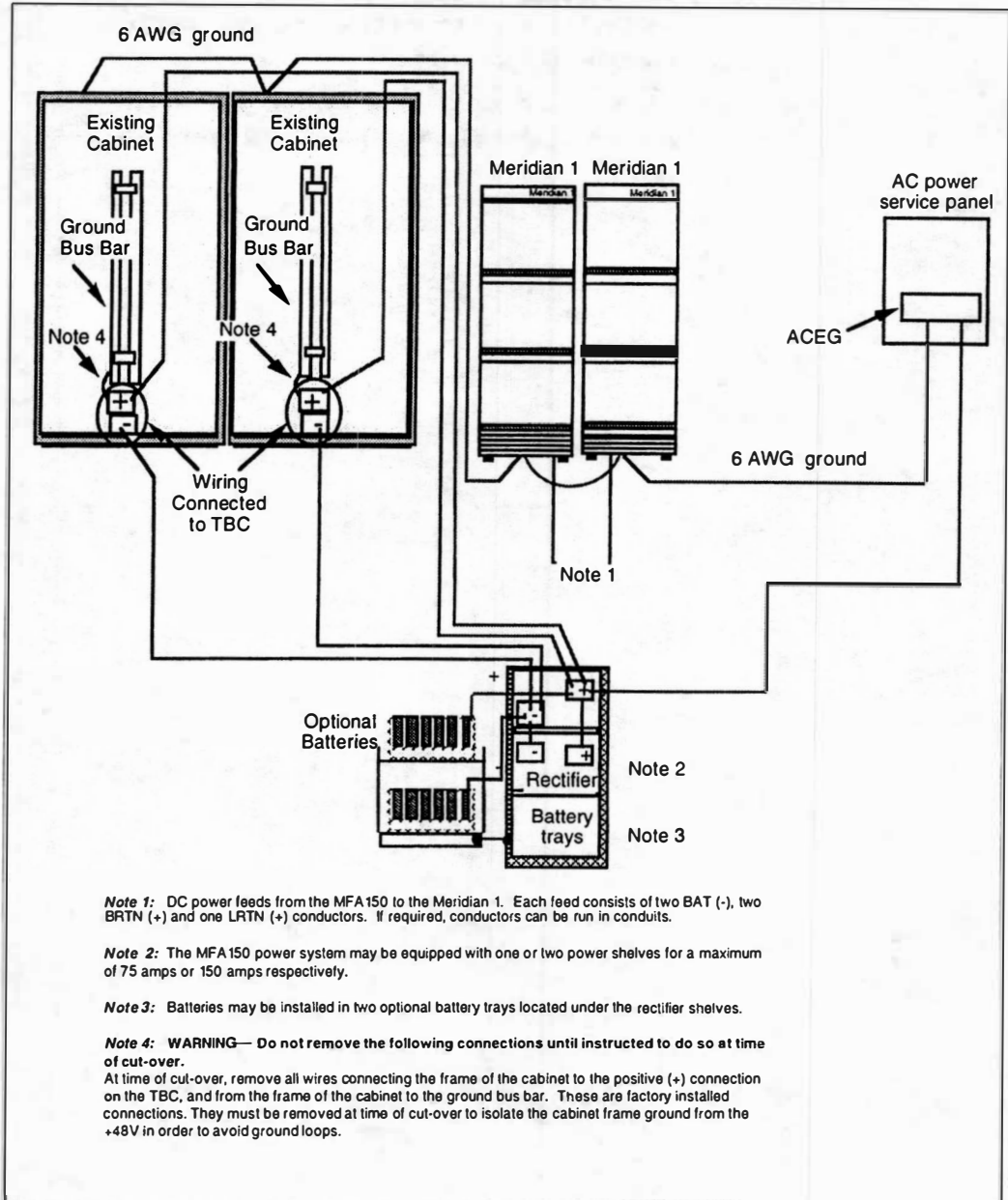
Figure 17-6

Typical arrangement using a customer provided common DC power supply



An MFA150 power system as a common power source

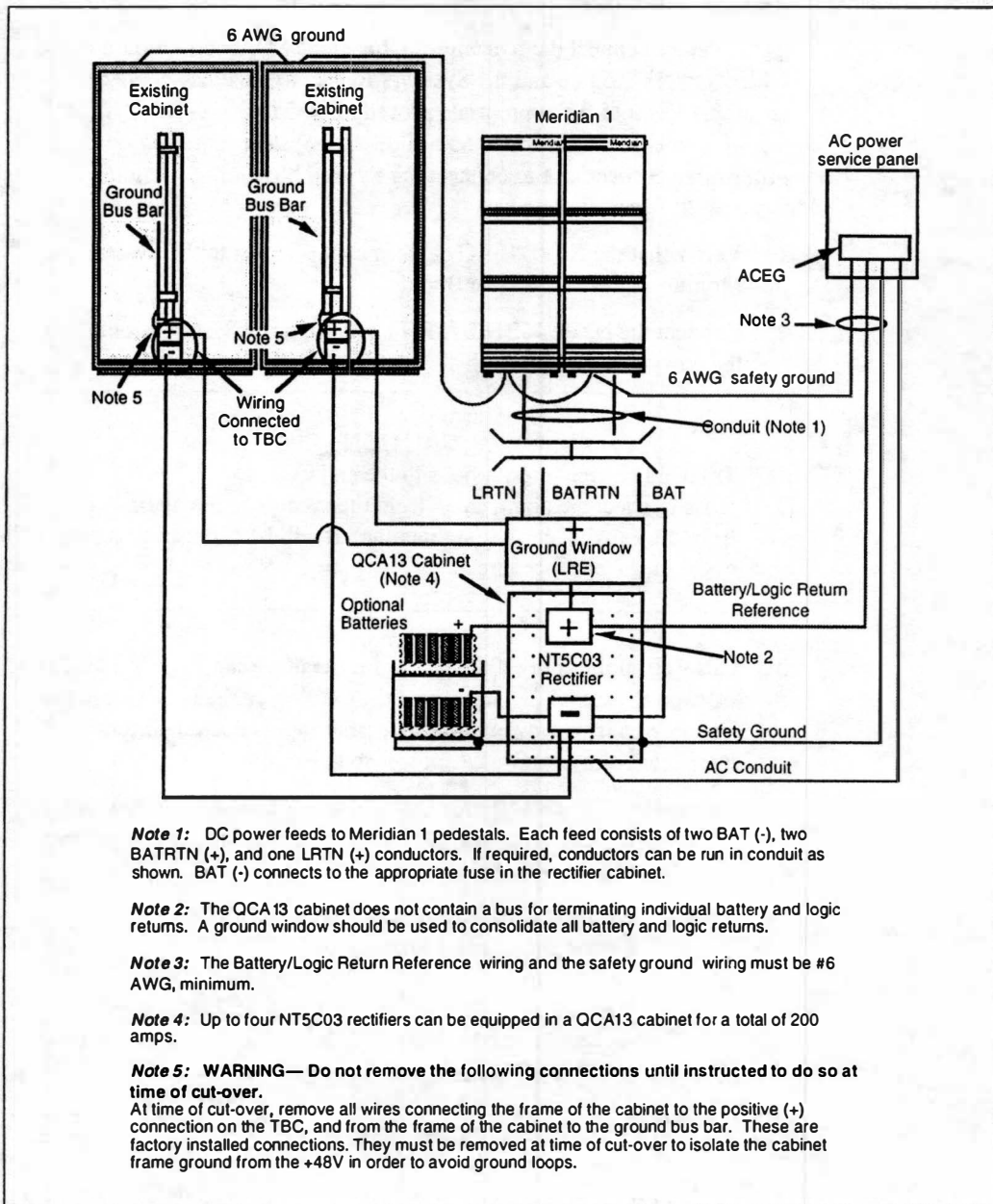
- An MFA150 power system assembly can be used as a common power source for both the Option 51 and the existing cabinets as shown in Figure 17-7. To connect the existing cabinets, disconnect the + and - 48V power leads from the existing power source, then reroute and connect them to the MFA150 power system. The connections are located under the top cover of the MFA150 power system. The connections at the TBC of the existing cabinet do not change.
- More information about connections for the MFA150 power system is located in 553-3001-210, *System installation procedures*. Refer to the documentation provided with the existing system for information about disconnecting and removing the old rectifier and batteries.

Figure 17-7**Typical arrangement using an MFA150 power system as a common power source**

An existing QCA13 power cabinet as a common power source

- A QCA13 power cabinet equipped with rectifiers can be used as a common power source for both the Option 21E and the existing cabinets as shown in Figure 17-8.
- For information about connections for the QCA13 power cabinet, refer to 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 17-8
Typical arrangement using a QCA13 as a common power source



Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 51 modules.

These cables connect the System Monitor to the SDI Paddle Board in the CPU/Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section '**Separate power source**' earlier in this document for a description of a separate DC power source.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 17-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 51 system:

- 1 Power up and initially load the Option 51 column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.

- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
 - 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
 - 4 The Meridian 1 Option 51 system is now operational.
-

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 51 column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 Connect an NT8D86 cable between the connector on the faceplate of the network card and the I/O panel of the Option 51. One cable is required for each network loop.
- 2 Connect an NT8D73 shielded cable, up to 30 ft (9 m) in length, to the connector on the I/O panel of the Option 51. Route the NT8D73 cable to the existing cabinet. Do not connect it to the Peripheral Buffer card in the existing cabinet at this time.

Note: Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

- 3 If required in the existing cabinet (see Note) connect an NT8D86 cable to the connector on the NT8D73 shielded cable from the Option 51. Make sure that the connectors are locked together with the locking devices. Do not connect the cable to the faceplate of the Peripheral Buffer card at this time. It will be connected as part of the cutover procedure.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable.

Cutting-over

The following procedure describes how to cut-over to the Option 51 system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL12 or QCA13 unit**
Remove the fuses from the -48V fuse panel corresponding to each cabinet and column.
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.

Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.

 - **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
 - 2 If required, perform power modifications to the existing cabinets.
 - 3 In the existing cabinets, remove the wiring connecting the frame of the cabinet to the positive (+) connection of the TBC, and the wiring connecting the frame to the cabinet ground bus bar. Refer to Figures 17-5 through 17-7.
- Note:* This wiring was factory installed. It must be removed to avoid ground loops when existing cabinets are used with Meridian 1 modules.

- 4 This step applies only to Meridian 1 modules connected to a DC power source.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 17-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
 - the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.
- 5 This step applies only if a new common power source with battery backup connected to a QBL12 or QBL15 battery distribution box is to be used.

Note: This step does not apply if the common power source uses an MFA150 rectifier.

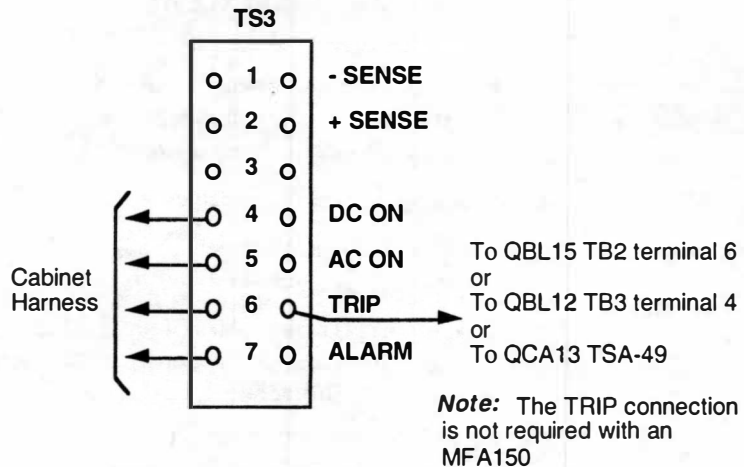
A TRIP lead must be connected to the TRIP connection on:

- the TRIP terminal on the terminal strip on the rectifier in existing cabinets equipped with a rectifier.
- the TRIP terminal of TS3 in existing cabinets not equipped with a rectifier.

The TRIP leads must be connected as follows.

If the existing rectifier is being removed from the cabinet, make the following wiring changes.

- a) If not already connected to TS3, tag and move the cabinet harness DC ON, AC ON, TRIP and ALARM leads presently connected on the rectifier to TS3 as shown in the above drawing. Depending on the type of existing cabinet, the TS3 is located either on the cabinet's TBC block, or on the QUT3 power unit.



- b) Install and connect a 16 AWG wire from terminal 6 (TRIP) on TS3 to the TRIP connection in the QBL12 or QBL15 battery distribution box or QCA13 cabinet. If there are two or more existing cabinets, "daisy chain" the TRIP connections in each cabinet with 16 AWG wire.
- c) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.

Note: The DC ON, AC ON and ALARM lead functions are performed by the Meridian 1 module. Leaving these leads connected in the existing cabinets only extends the alarm indicators to the QPC84 power monitors. If you wish, you may leave these leads disconnected. However, the TRIP lead must be connected.

If the existing rectifier is to remain in the cabinet, make the following wiring changes.

- a) Install and connect a 16 AWG wire from the TRIP connection on the terminal strip of the rectifier to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connection on the terminal strip of the rectifier in each cabinet with 16 AWG wire. In existing cabinets not equipped with a rectifier (such as a QCA7 cabinet powered by a QCA8 cabinet), 'daisy chain' to the TRIP connection on TS3.
 - b) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.
- 6 Cross-connect the alarm cables as shown in Figure 17-10.
 - 7 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.
 - 8 Connect the NT8D86 cables (if provided) or NT8D73 shielded network cables from the Option 51 to the connector on the faceplate of the Peripheral Buffer circuit card in the existing cabinets.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable. The NT8D73 shielded cable can be connected directly to the connector of the Peripheral Buffer card.

—OR—

If the existing cabinet is equipped to suppress EMI, the NT8D73 shielded cable should be connected to its assigned filter connector. See 553-3001-150, *Upgrade Engineering* for more information.

- 9 Remove the QPC84 Power Monitor from the QCA109 cabinet and set switch C11, position 2 to ON. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required. Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.

Note: Disregard any remaining alarm indications. Alarm indications should return to normal once the upgrade is completed and equipment that is no longer required has been removed as described later in this chapter.

- 10 Restore power to the cabinets and column by reinserting the removed fuse and resetting all circuit breakers to ON.

CAUTION

Do not remove the NT8D22 system monitor (XSM) from the column while the system is in service. Removing the XSM may cause the input circuit breakers on the existing cabinets to trip.

- 11 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.
-

Figure 17-9
NT8D46 cable types

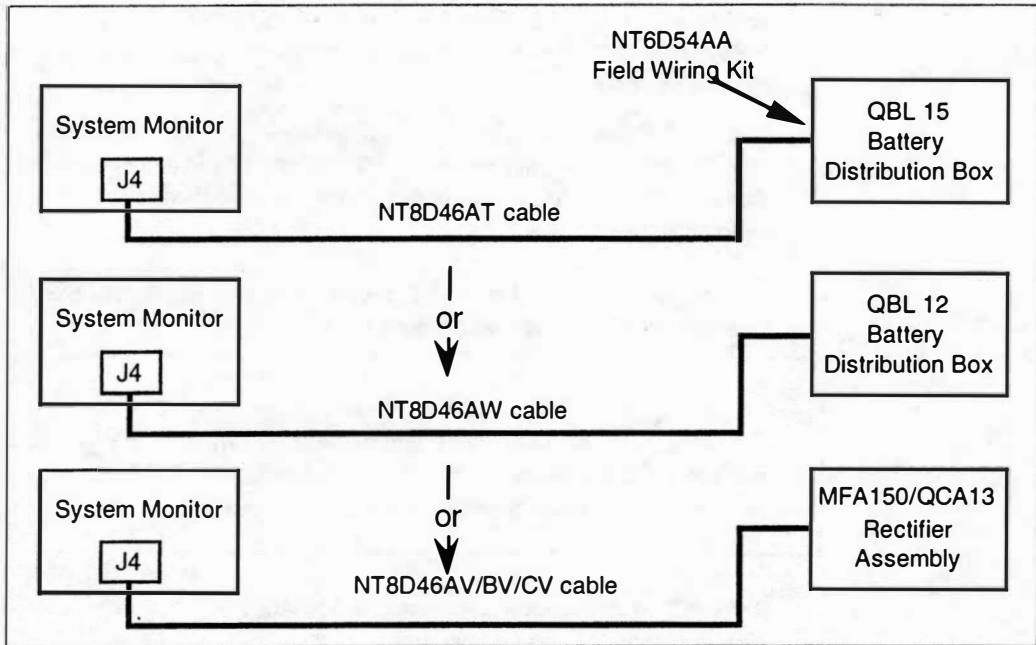
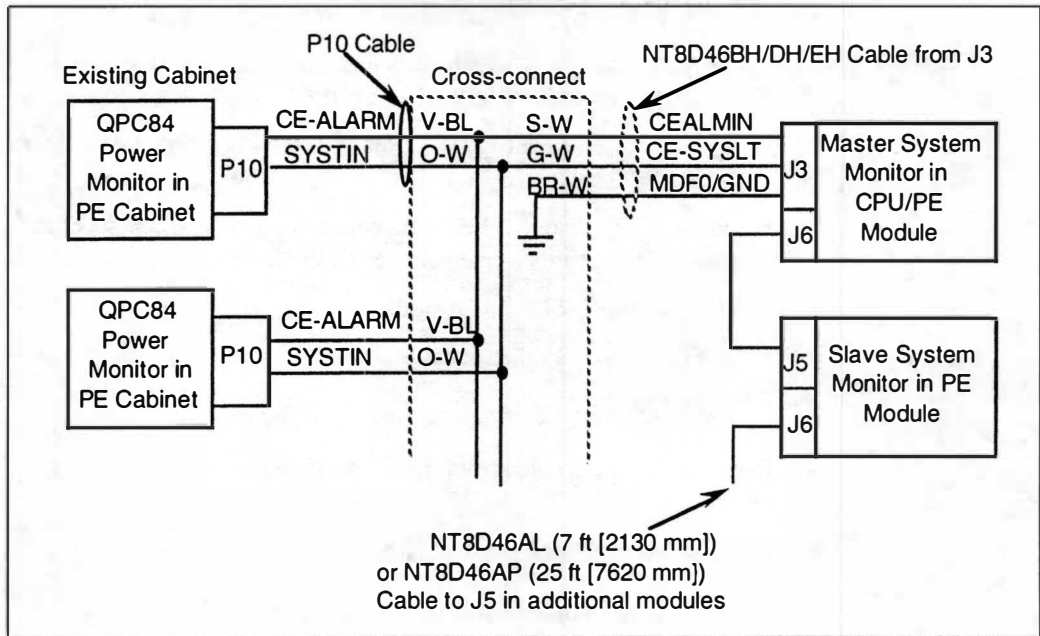


Figure 17-10
Connecting alarm cables between a cabinet and a column



Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

Removing equipment no longer required

The following procedure describes how to remove the equipment that is no longer required once the Option 51 is operating normally.

- 1 Set circuit breakers CB7, CB8, CB9 and CB10 on the QSP43 power control shelf in the QCA109 cabinet to OFF.
- 2 Remove the fuse labeled TPUN1 from the QSP43 power control shelf in the QCA109 cabinet.
- 3 Disconnect and remove cables from connectors on the faceplate of the following circuit cards located on the CE shelf:
 - QPC425 CPU/SDI circuit card.
 - QPC376 network circuit cards.
 - QPC139 SDI2 circuit cards, if equipped.
- 4 Remove CE circuit cards from the CE shelf and store them in a safe place.
- 5 Remove the tape unit from the cabinet.

Note: The tape unit must first be removed before the tape unit connector can be disconnected.

- Disconnect the power connector from the cabinet power wiring harness to the shelf housing the tape unit or QMM38 Mass Storage Unit, if equipped.
 - Tape all exposed power leads with electrical insulation tape.
- 6 If you are using the main CE shelf for DTI/PRI cards:
 - Install the DTI/PRI cards in the CE shelf card slots.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the CPU/Network module of the Option 51 upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breakers CB7, CB8, CB9 and CB01 on the QSP43 power control shelf to ON.

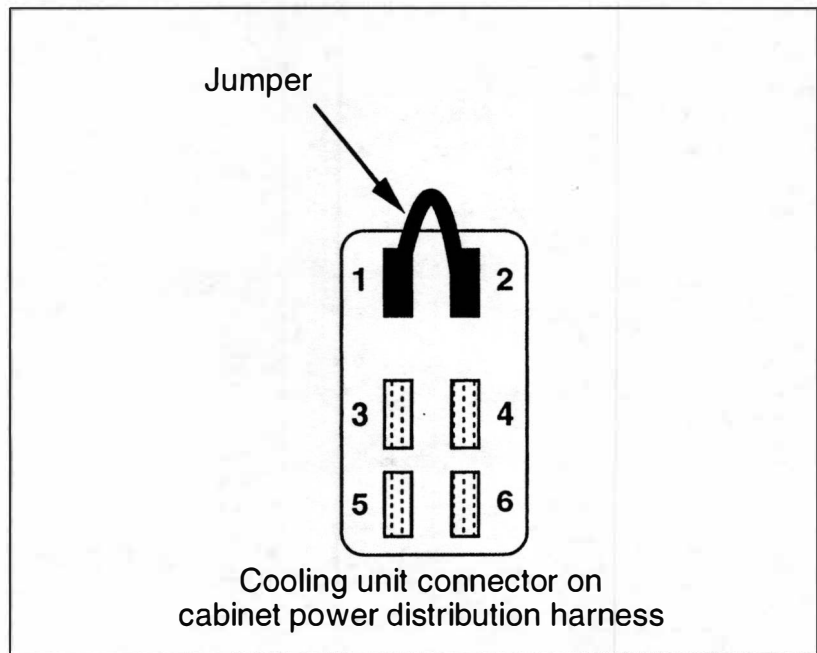
7 If you are not going to use the CE shelf for DTI/PRI cards:

- Disconnect the harness alarm connector C21 from the CE shelf.
- Unplug all remaining circuit cards from the CE shelf.
- Disconnect power connections from the backplane of the QSP39 shelf.

Note: If the cabinet is equipped with an expansion CE shelf (a second CE shelf) disconnect and remove the wiring between the +5V, +12V, -12V, and LGND connections on the CE shelf.

- Disconnect and remove the QUD15 cooling unit. Place a jumper (a piece of 24 or 26 AWG bare wire or a paper clip can be used) across power monitor leads 1 and 2 of the cooling unit power connector as shown in Figure 17-11. This disables the alarm for the removed unit.

Figure 17-11
Cooling unit alarm connection



SL-1 QCA136 cabinet upgrade to Meridian 1 Option 51

This procedure is used to upgrade an SL-1 QCA136 cabinet (ST, 21 or 21E) to Meridian 1 Option 51. To upgrade to a Meridian 1 Option 51 system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 51 is operating with the new software provided with the Option 51.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Modular upgrade of an SL-1 QCA136 cabinet (ST, 21 or 21E) to Meridian 1 Option 51

Equipment required

Table 18-1 lists minimum hardware requirements needed to upgrade to a DC powered Meridian 1 Option 51 system.

Table 18-1

Minimum hardware requirements for a DC Meridian 1 Option 51

Quantity	Part number	Description
1	NT6D39DC	CPU/Network Module DC
1	NT6D41AB	CE Power Supply DC
1	NT7D00BA	Top Cap DC
1	NT7D09CA	Pedestal DC
1	NT7D10CA	System Monitor Panel Assembly
1	NT7D67CA	Power Distribution Unit and filter assembly
1	NT8D17EA	Extended Conference/TDS Card
1	NT8D22AC	System Monitor
1	NT8D41AA	2 Port SDI Paddle Board
1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	NT8D46BH	System Monitor to MDF Cable
1	NT8D52DD	Pedestal Blower Unit DC
1	NT8D78AA	CPU Cable
1	NT8D80AB	MSI to MDU Cable, 2 ft (610 mm)
1	NTND08AA	ROM Card
1	NTND09CA	12 MB Memory Card
1	NTND10AA	Changeover & Memory Arbitrator Card
1	NTND16AA	4MB Multi Disk Unit (MDU)
1	QPC43R	Peripheral Signaling Card
-continued-		

Table 18-1 (continued)
Minimum hardware requirements for a DC Meridian 1 Option 51

Quantity	Part number	Description
1	NT8D46AX or NT8D46BC	System Monitor Cable QCA136 cabinet or QCA137 cabinet and CE/PE module (see Figure 18-10 and 18-11) or QCA136 and QCA137 cabinets and CE/PE module (see Figure 18-12)
1	NT8D84AA	XSDI to I/O panel Cable
1	NT8D93AJ	XSDI to TTY cable, 16 ft (4875 mm)
1	QPC84Q	Power Monitor
1	QPC441F	3 Port Extender Card
1	QPC579	CPU Function Card
1	QPC580C	CPU Interface Card
1	QPC584L	Mass Storage Interface Card
1	QPC477A-09	Bus Terminating Unit
1	QPC477A-10	Bus Terminating Unit
1	QPC477B-22	Bus Terminating Unit

Note: The vintages shown on circuit cards in Table 18-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA136 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 51 Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 51 to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 51 to the existing cabinet.
- An NT9J98 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 51 system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 18-1 shows a typical QCA136 cabinet and Figure 18-2 shows a QCA136 cabinet that has been upgraded to Meridian 1 Option 51.

Figure 18-1
Typical QCA136 cabinet

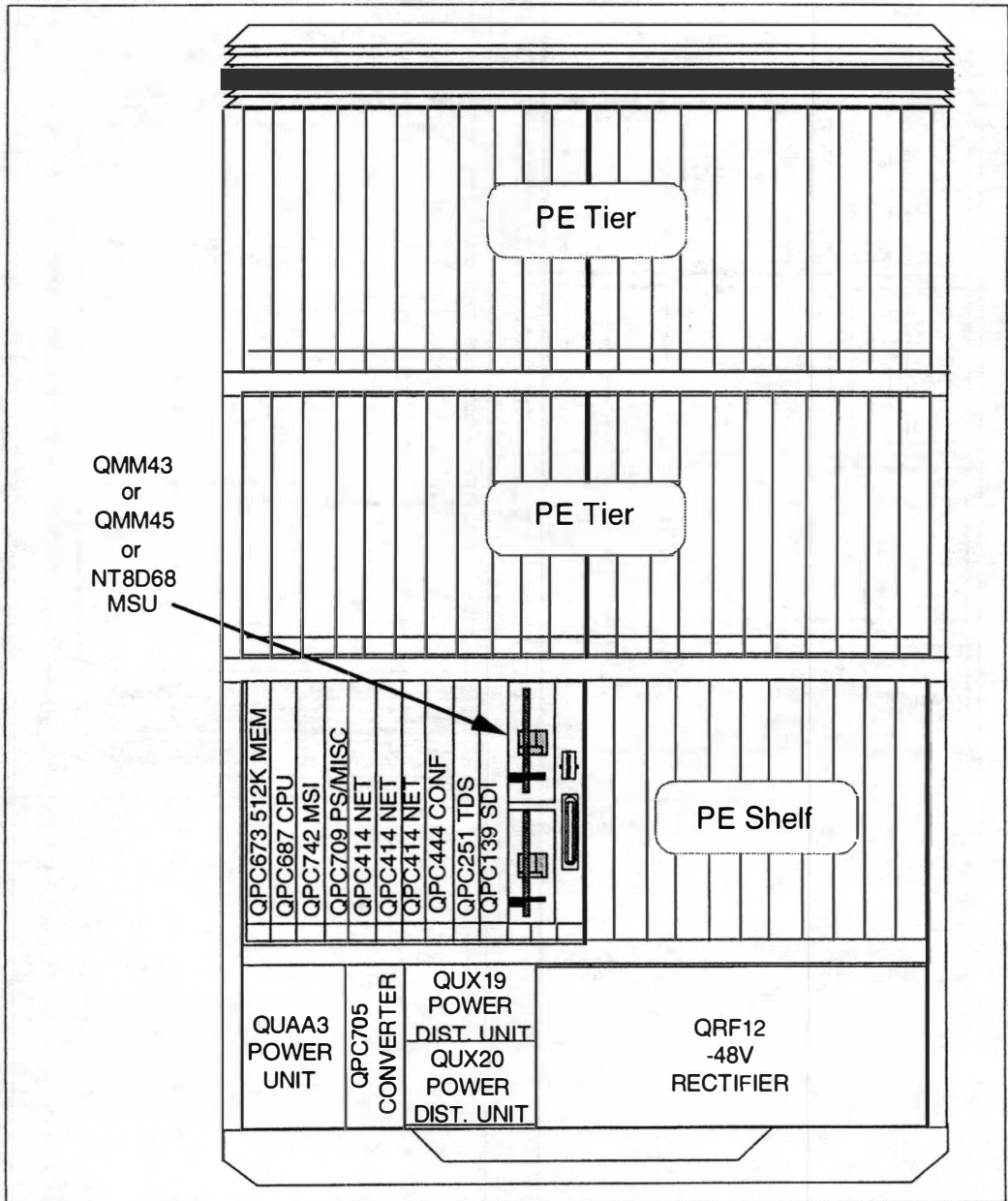
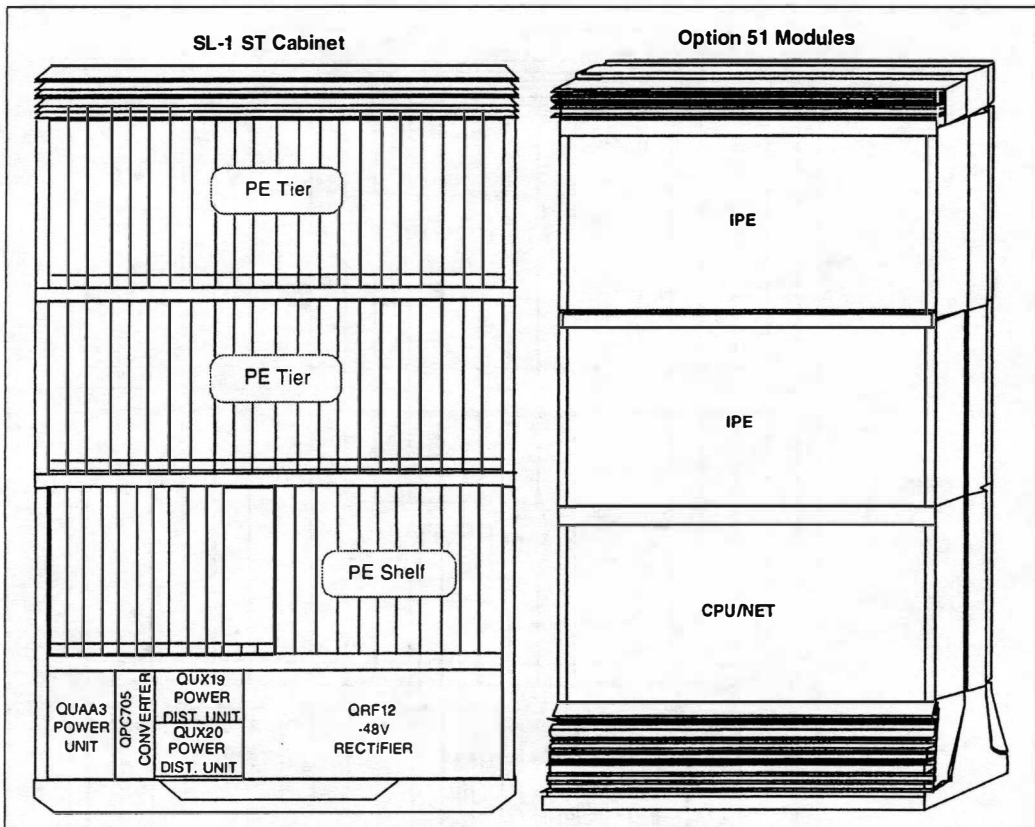


Figure 18-2

Typical QCA136 cabinet that has been upgraded to Meridian 1 Option 51



Installing the Meridian 1 Option 51 system

The Option 51 equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, CPU/Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 51 equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 18-2 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.
- Install cabling:

- Cable common equipment
- Cable network loops (within the Option 51 columns only).

Note: Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.

- Cable PE/TPE modules to the MDF and connect lines and trunks.
- Inspect Option 51 equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 18-3 shows Option 51 circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 18-2

NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 18-2 (continued)

NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 18-2 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves									Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."
For each slave, indicates the slave address									Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master			on					
	slave			off					
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

Table 18-2 (continued)

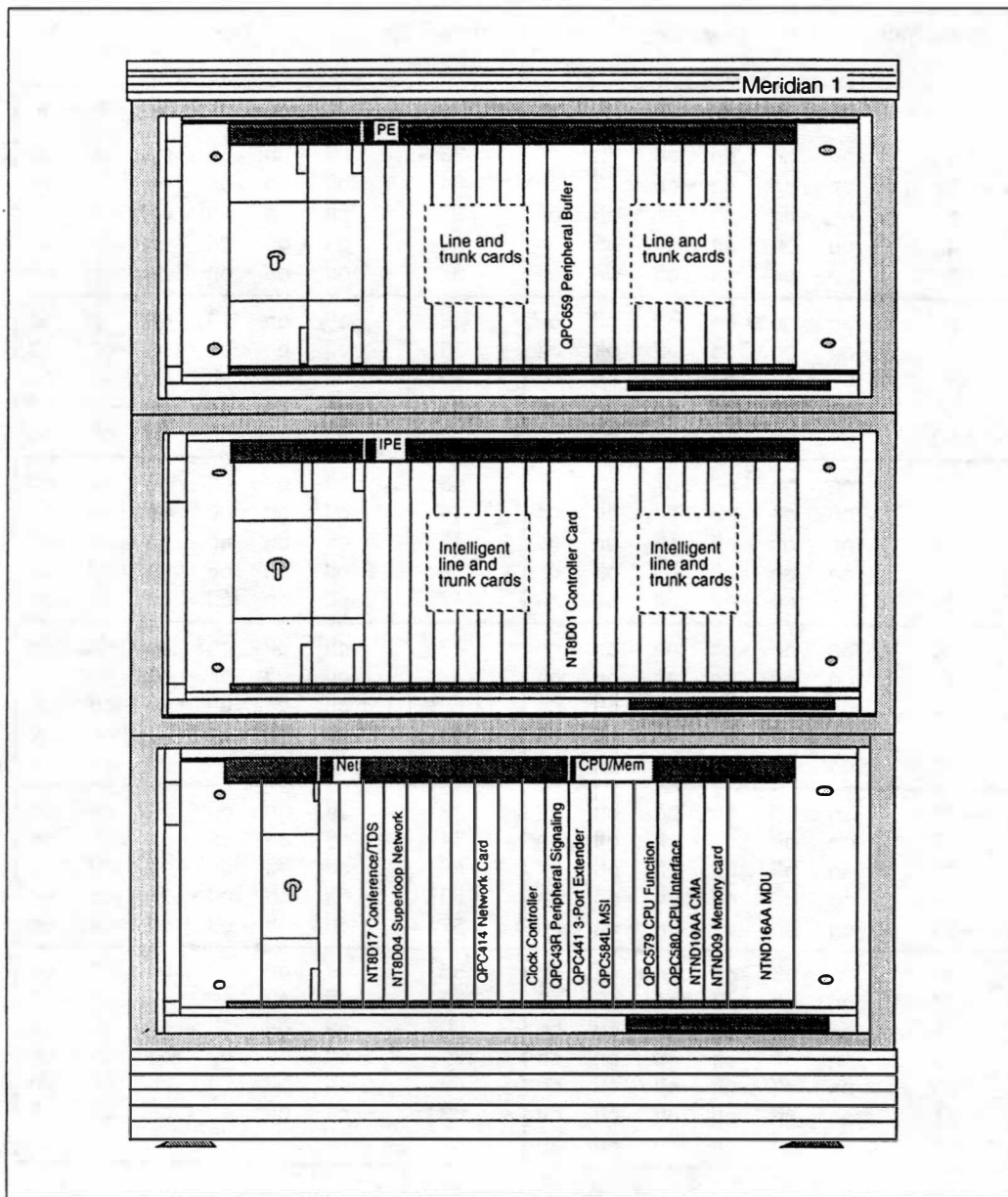
NT8D22 system monitor — settings for total number of slaves — SW2 on master

How many slave units		Switch position						How many slave units		Switch position					
		3	4	5	6	7	8			3	4	5	6	7	8
0		on	on	on	on	on	on	32		off	on	on	on	on	on
1		on	on	on	on	on	off	33		off	on	on	on	on	off
2		on	on	on	on	off	on	34		off	on	on	on	off	on
3		on	on	on	on	off	off	35		off	on	on	on	off	off
4		on	on	on	off	on	on	36		off	on	on	off	on	on
5		on	on	on	off	on	off	37		off	on	on	off	on	off
6		on	on	on	off	off	on	38		off	on	on	off	off	on
7		on	on	on	off	off	off	39		off	on	on	off	off	off
8		on	on	off	on	on	on	40		off	on	off	on	on	on
9		on	on	off	on	on	off	41		off	on	off	on	on	off
10		on	on	off	on	off	on	42		off	on	off	on	off	on
11		on	on	off	on	off	off	43		off	on	off	on	off	off
12		on	on	off	off	on	on	44		off	on	off	off	on	on
13		on	on	off	off	on	off	45		off	on	off	off	on	off
14		on	on	off	off	off	on	46		off	on	off	off	off	on
15		on	on	off	off	off	off	47		off	on	off	off	off	off
16		on	off	on	on	on	on	48		off	off	on	on	on	on
17		on	off	on	on	on	off	49		off	off	on	on	on	off
18		on	off	on	on	off	on	50		off	off	on	on	off	on
19		on	off	on	on	off	off	51		off	off	on	on	off	off
20		on	off	on	off	on	on	52		off	off	on	off	on	on
21		on	off	on	off	on	off	53		off	off	on	off	on	off
22		on	off	on	off	off	on	54		off	off	on	off	off	on
23		on	off	on	off	off	off	55		off	off	on	off	off	off
24		on	off	off	on	on	on	56		off	off	off	on	on	on
25		on	off	off	on	on	off	57		off	off	off	on	on	off
26		on	off	off	on	off	on	58		off	off	off	on	off	on
27		on	off	off	on	off	off	59		off	off	off	on	off	off
28		on	off	off	off	on	on	60		off	off	off	off	on	on
29		on	off	off	off	on	off	61		off	off	off	off	on	off
30		on	off	off	off	off	on	62		off	off	off	off	off	on
31		on	off	off	off	off	off	63		off	off	off	off	off	off
— continued —															

Table 18-2 (continued)
NT8D22 system monitor — slave address — SW2 on slave

Slave unit address							Position							Slave unit address							Position						
							3	4	5	6	7	8								3	4	5	6	7	8		
1	on	on	on	on	on	off	33	off	on	on	on	on	on	off	33	off	on	on	on	on	off	on					
2	on	on	on	on	off	on	34	off	on	on	on	on	off	on	34	off	on	on	on	off	on						
3	on	on	on	on	off	off	35	off	on	on	on	on	off	off	35	off	on	on	on	off	off						
4	on	on	on	off	on	on	36	off	on	on	off	on	on	36	off	on	on	off	on	on							
5	on	on	on	off	on	off	37	off	on	on	off	on	off	37	off	on	on	off	on	off							
6	on	on	on	off	off	on	38	off	on	on	off	off	on	38	off	on	on	off	off	on							
7	on	on	on	off	off	off	39	off	on	on	off	off	off	39	off	on	on	off	off	off							
8	on	on	off	on	on	on	40	off	on	off	on	on	on	40	off	on	off	on	on	on							
9	on	on	off	on	on	off	41	off	on	off	on	on	off	41	off	on	off	on	on	off							
10	on	on	off	on	off	on	42	off	on	off	on	off	on	42	off	on	off	on	off	on							
11	on	on	off	on	off	off	43	off	on	off	on	off	off	43	off	on	off	on	off	off							
12	on	on	off	off	on	on	44	off	on	off	off	off	on	44	off	on	off	off	on	on							
13	on	on	off	off	on	off	45	off	on	off	off	off	on	45	off	on	off	off	on	off							
14	on	on	off	off	off	on	46	off	on	off	off	off	off	46	off	on	off	off	off	on							
15	on	on	off	off	off	off	47	off	on	off	off	off	off	47	off	on	off	off	off	off							
16	on	off	on	on	on	on	48	off	off	on	on	on	on	48	off	off	on	on	on	on							
17	on	off	on	on	on	off	49	off	off	on	on	on	off	49	off	off	on	on	on	off							
18	on	off	on	on	off	on	50	off	off	on	on	off	on	50	off	off	on	on	off	on							
19	on	off	on	on	off	off	51	off	off	on	on	off	off	51	off	off	on	on	off	off							
20	on	off	on	off	on	on	52	off	off	on	off	on	on	52	off	off	on	off	on	on							
21	on	off	on	off	on	off	53	off	off	on	off	on	off	53	off	off	on	off	on	off							
22	on	off	on	off	off	on	54	off	off	on	off	off	on	54	off	off	on	off	off	on							
23	on	off	on	off	off	off	55	off	off	on	off	off	off	55	off	off	on	off	off	off							
24	on	off	off	on	on	on	56	off	off	off	on	on	on	56	off	off	off	on	on	on							
25	on	off	off	on	on	off	57	off	off	off	on	on	off	57	off	off	off	on	on	off							
26	on	off	off	on	off	on	58	off	off	off	on	off	on	58	off	off	off	on	off	on							
27	on	off	off	on	off	off	59	off	off	off	on	off	off	59	off	off	off	on	off	off							
28	on	off	off	off	on	on	60	off	off	off	off	on	on	60	off	off	off	off	on	on							
29	on	off	off	off	on	off	61	off	off	off	off	on	off	61	off	off	off	off	on	off							
30	on	off	off	off	off	on	62	off	off	off	off	off	on	62	off	off	off	off	off	on							
31	on	off	off	off	off	off	63	off	off	off	off	off	off	63	off	off	off	off	off	off							
32	off	on	on	on	on	on																					

Figure 18-3
Meridian 1 Option 51 CPU/Network and IPE modules



Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 51: one that is designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 51, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Connect the DC power to the Option 51 columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 51 equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 51 module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 51 modules.
- a new power source installed in conjunction with the Option 51.

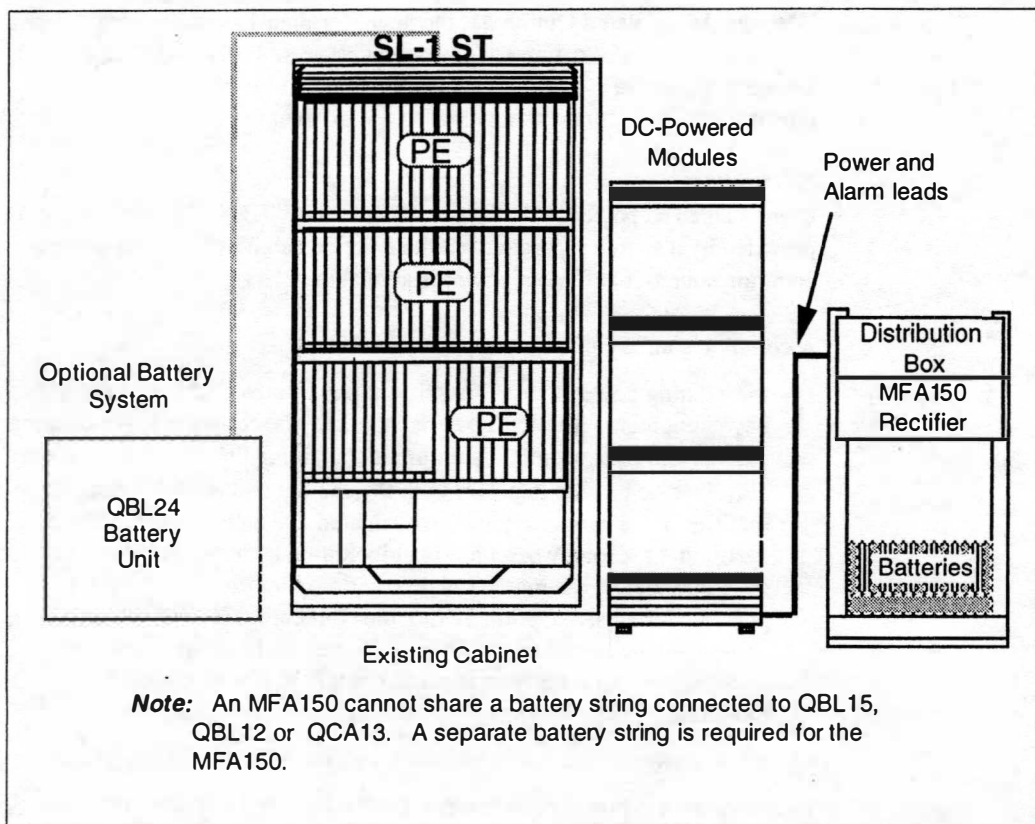
To determine the power requirements for the Option 51 system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 18-4 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 51 modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 51 column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 18-4

Typical arrangement of independently DC-powered Meridian 1 Option 51 modules

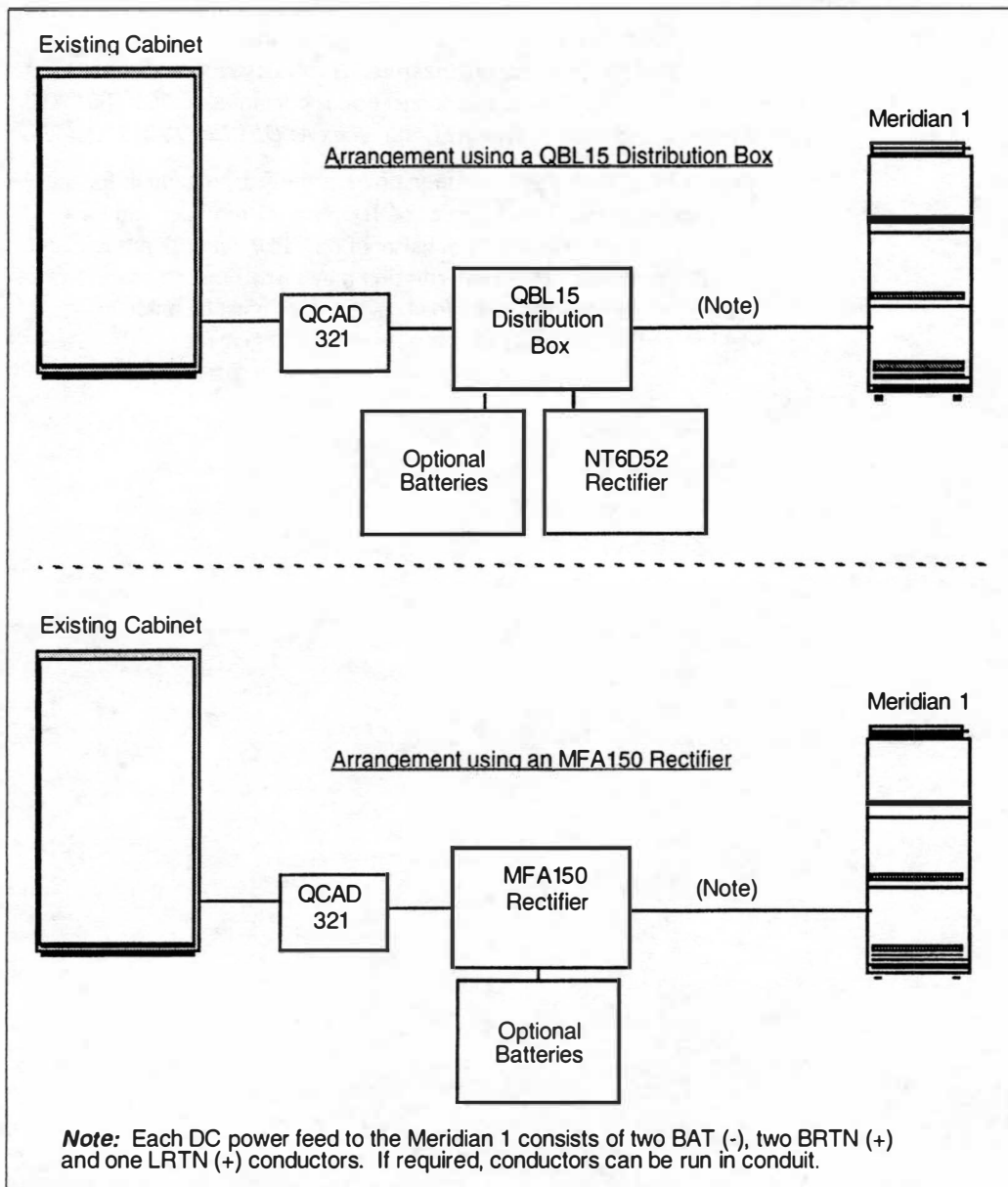


Common power source

Existing cabinet rectifier as a common power source

- For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 18-5 illustrates a common power supply arrangement for the upgraded system. This includes both Option 51 modules and the existing cabinet. Option 51 consists of one CPU/Network module and two IPE modules. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

Figure 18-5
Typical arrangement using a common DC power supply with optional battery backup



Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 51 modules.

These cables connect the System Monitor to the SDI Paddle Board in the CPU/Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section '**Separate power source**' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150) cable (see Figure 18-13) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL15 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 51 system:

- 1 Power up and initially load the Option 51 column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.

- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
- 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
- 4 The Meridian 1 Option 51 system is now operational.

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 51 column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 If EMI regulations apply to the existing cabinet, install the NT9J98 and NT8D73 cable(s) as follows:(see Figure 18-6)
 - Feed the hooded end of the NT9J98 cable(s) through the rear EMI panel of the cabinet.
 - Attach the I/O panel end of the NT9J98 cable(s) to the rear EMI panel (see Figure 18-8).
 - Layout the hooded end of the NT9J98 cable(s) to the DLB card in the cabinet.
 - If two NT9J98 cables are mounted at a single I/O panel opening, attach the support plate provided with the NT9J98 cable using the screws also provided (see Figure 18-9).
 - Connect the NT8D73 cable(s) to the NT9J98 cable(s). Secure the connection with the bail locks on the NT9J98 cable(s).
 - Connect the other end the NT8D73 cable(s) to its assigned connector on the Meridian 1 module. Each loop requires one cable.
- 2 This step applies only if the existing cabinet is not subject to EMI regulations.(see Figure 18-7)
 - Layout a NT8D85 cable between the QPC414 Network Card and the DLB card.

Figure 18-6
Cable types and cable routing — EMI suppression

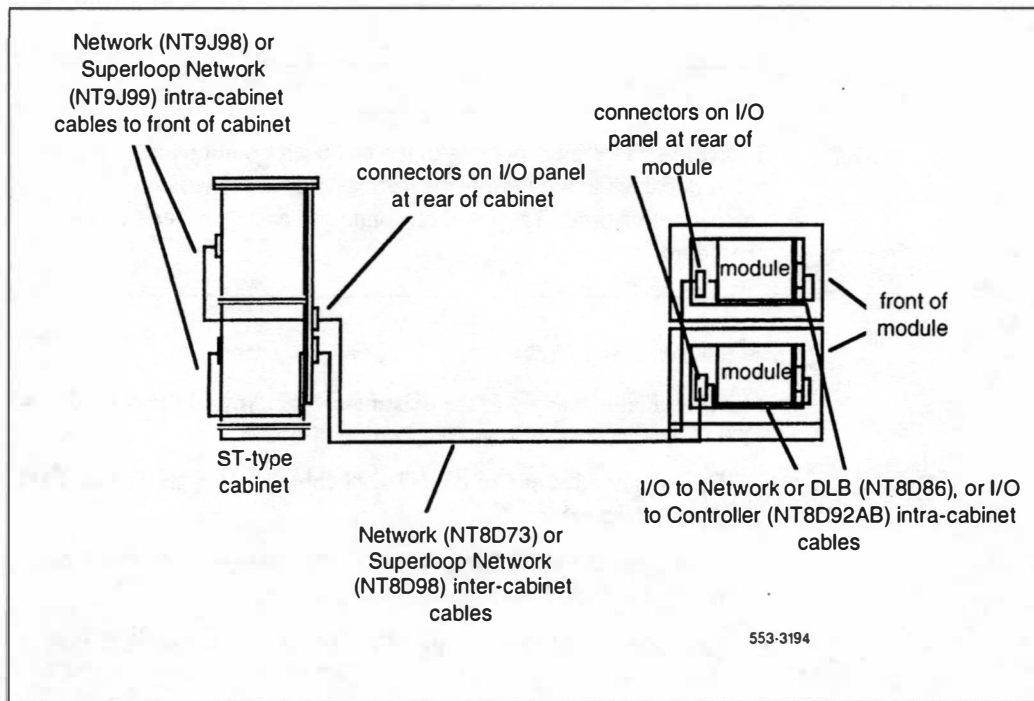


Figure 18-7
Cable types and cable routing — without EMI suppression

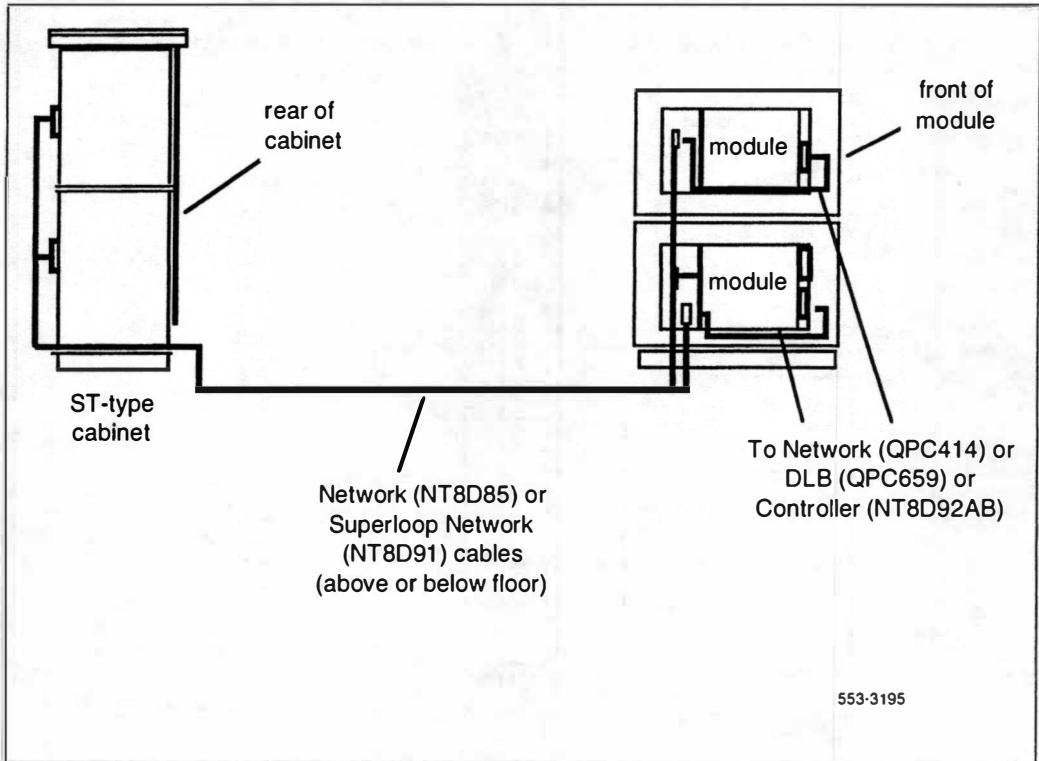


Figure 18-8
Installing NT9J98 cable on EMI panel

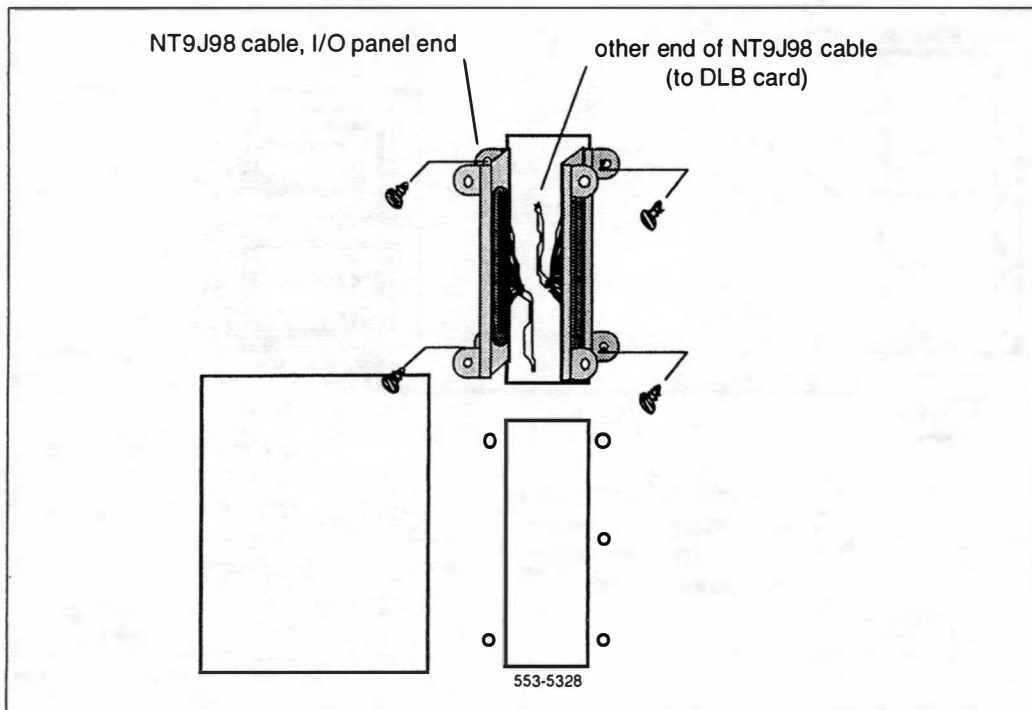
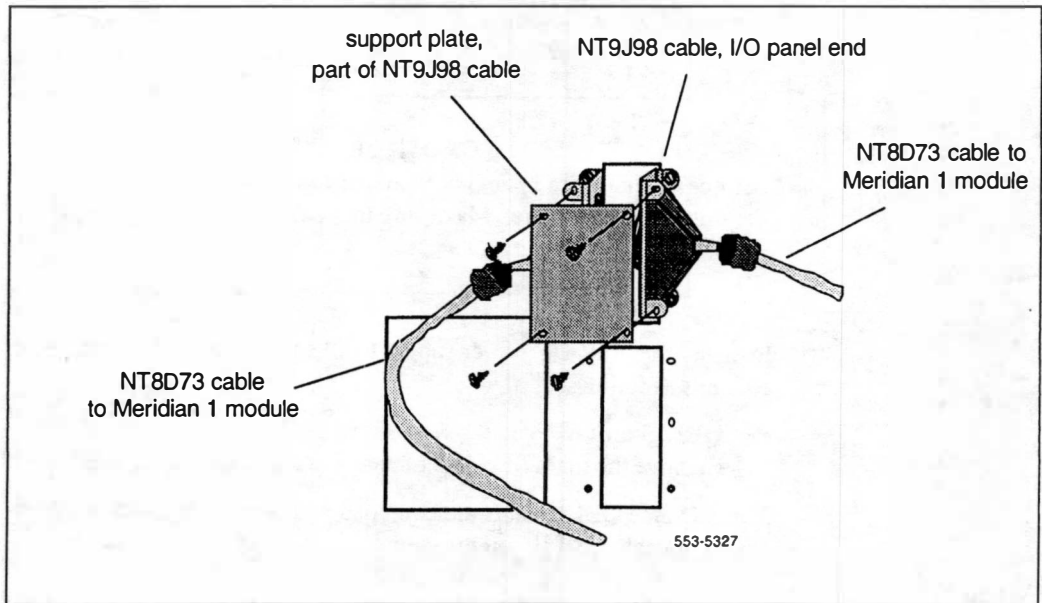


Figure 18-9
Installing NT8D73 cable on EMI panel



Cutting-over

The following procedure describes how to cut-over to the Option 51 system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:

- **QBL15 unit**

Remove the main fuse or set the main circuit breaker to OFF.

Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.

- **QBL24**

Set the circuit breaker on the battery unit to OFF.

Set the circuit breaker on the rectifier in the QCA136/QCA137 to off

- **MFA150 unit**

Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.

- 2 Connect the previously prepared network cables to their assigned Peripheral Buffer or Controller card in the existing cabinet.
- 3 This step applies only to Meridian 1 modules connected to a DC power source.

CAUTION

When a **common** DC power source is used, **do not** connect a TRIP lead to the existing QCA136 or 137 cabinet.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150) cable (see Figure 18-13) from connector J4 to:

- the MFA150 as described in 553-3001-210,
System Installation Procedures,
or
 - the QBL15 as described in the Appendix A, 553-3001-210,
Installing and connecting.
- 4 Go to the next procedure and connect the system monitor according to the system configuration. There are three configurations described. They are:

Configuration 1 — QCA136 cabinet and CE/PE Module

Configuration 2 — QCA137 cabinet and CE/PE Module

Configuration 3 — QCA136, QCA137 cabinet and CE/PE Module

Connecting system monitor

The following three procedures describe the method of connecting the system monitor to each of the three possible ST configurations.

Configuration 1

Connecting system monitor ST system with QCA136 and CE/PE Module

The following procedure describes how to connect the system monitor in an ST system equipped with a QCA136 cabinet and a CE/PE Module. The CPU is located in the module.

Note: This procedure requires removing the EMI back panel from the cabinet. If alarm monitor connections to the MDF are not required for remote alarm, CE alarm, SYSIN/SYSOUT or power fail transfer, skip steps 1 through 4 and directly install connector P1 of the NT8D46AX cable into connector J3 of the system monitor, ensuring the connections with a screwdriver.

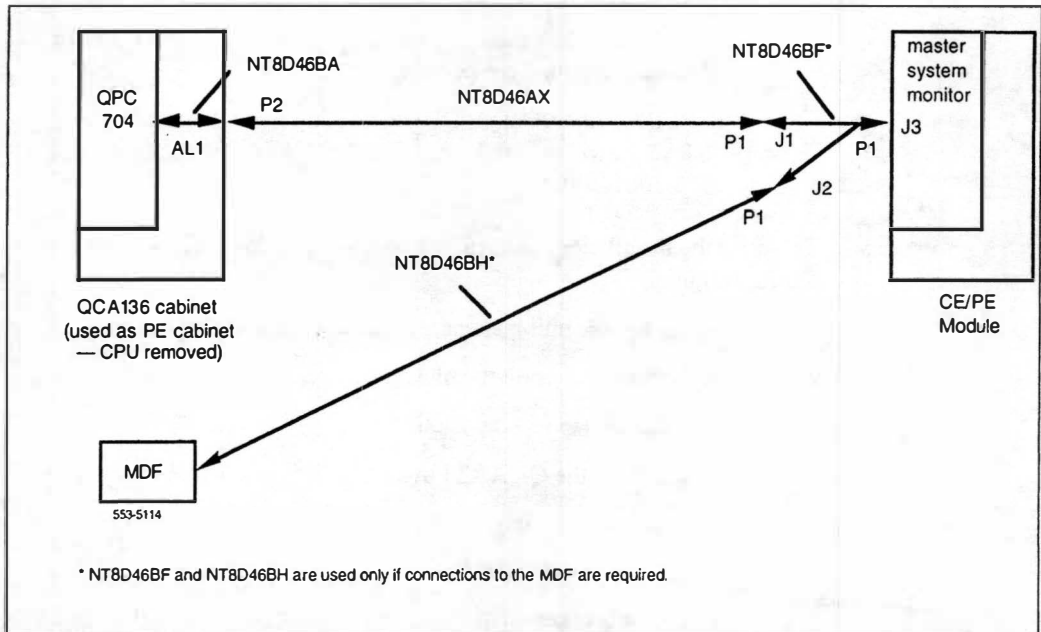
- 1 Install connector P1 of the NT8D46AX cable into connector J1 of the NT8D46BF cable. Ensure the connection with a screwdriver.

- 2 Install connector P1 of the NT8D46BF cable into connector J3 of the system monitor. Ensure the connection with a screwdriver.
- 3 Install connector P1 of the NT8D46BH cable into connector J2 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 4 Terminate the other end of the NT8D46BH cable.
- 5 Remove the QCA136 rear panels.
- 6 Remove the QCA136 EMI back panel. Verify that the GND1 and GND2 cables are tied together on the ground bar at the back of the QUAA3 Power Unit.
- 7 Unplug connector P5 of the existing harness from connector J5 on the rear of the QUAA3 Power Unit.
- 8 Install connector P5 of the NT8D46BA cable into connector J5 on the rear of the QUAA3 Power Unit.
- 9 Install connector J5 of the NT8D46BA cable into connector P5 of the existing harness.
- 10 Install connector ALM1 into the filter connector (P0678258) located in one of the three horizontal cutouts located at the bottom rear of the QCA136 cabinet.
- 11 Loosen screws REMA and REMB on terminal block TB2 of the QUX19 Power Distribution Unit.
- 12 Connect lug REMA (yellow wire) from the NT8D46BA cable to screw REMA on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw REMA.
- 13 Connect lug REMB (black wire) from the NT8D46BA cable to screw REMB on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw REMB.
- 14 Loosen one of the ground lugs located on the ground bar on the rear of the QUAA3 Power Unit with a 7/16" socket driver.
- 15 Connect the GND ring lug (2 black wires) to the loosened ground lug on the rear of the QUAA3 Power Unit and tighten with the socket driver.
- 16 Reinstall the EMI back panel.
- 17 Reinstall the QCA136 rear panels.

- 18 Restore power to the cabinet and column by reinserting the removed fuse and resetting all circuit breakers to on. Verify that all alarm LEDs on the QUAA3 Power Unit are on, except the CE/PE 1 LED which is on after approximately 90 seconds. Verify that the maintenance console displays message:

PWR0055 00 0 0

Figure 18-10
Connecting system monitor — Configuration 1



Fault clearing

After powering up the system and sysloading is complete, wait 90 seconds then verify the following:

- 1 The PFTU (if installed) is not activated.
- 2 All LEDs on the QUAA3 Power Unit stay on. If not, verify that steps 13 through 22 of the installation procedure have been completed.
- 3 The LED on the top cap of the CE/PE Module is off. If not, perform one of the following:
 - unseat the system monitor, verify the switch settings (Table 18-2), and reinstall it into the pedestal
 - use LD37, Input/Output Diagnostic, and issue the command "STAT XSM" to identify the fault. See *X11 input/output guide* (553-3001-400).

To verify the installation, perform the following optional procedure on the CE/PE Module:

- 1 Locate the blower unit inside the pedestal of the CE/PE Module.
- 2 Set the circuit breaker on the blower unit to off. Verify the following:
 - the LED on the top cap is on
 - all LEDs on the QUAA3 Power Unit stay on.
 - the maintenance console displays message:
PWR0006 FANU 00 0 0
- 3 Set the circuit breaker on the blower unit back on. Verify that the LED on the top cap is off, and the maintenance console displays message:
PWR0046 FANU 00 0 0
- 4 Perform a data dump using LD43.
- 5 Perform a sysload on the CE/PE Module. Verify the following:
 - the CE/PE 1 LED on the QUAA3 Power Unit is off
 - the PFTU (if installed) is activated
 - the LED on the top cap of the CE/PE Module is on
 - the LEDs on all ringing generators are off

6 Wait 90 seconds after the sysload, then verify the following:

- the CE/PE 1 LED is on
- the PFTU (if installed) is deactivated
- the LED on the top cap of the CE/PE Module is off
- the LEDs on all ringing generators are on
- the maintenance console displays messages:

PWR0056 PFTU XX X X
PWR0055 XSMC 00 0 0
PWR0000 PWSP XX X X
(for each ringing generator)

To verify the installation, perform the following optional procedure on the QCA136 cabinet:

1 Hardware disable the QPC659 DLB card and verify the following:

- the PE 2-5 LED on the QUAA3 Power Unit is off
- the LED on the top cap of the CE/PE Module is off
- the maintenance console displays message:

PWR0015 XSMC 00 0 0

2 Hardware enable the QPC659 DLB card. Verify that the PE 2-5 LED is on and the maintenance console displays message:

PWR0055 XSMC 00 0 0

If any test fails, verify that the QCAD309A and NT8D46A Y cables are installed properly, and the switch settings on the system monitor are correct for this configuration.

Configuration 2

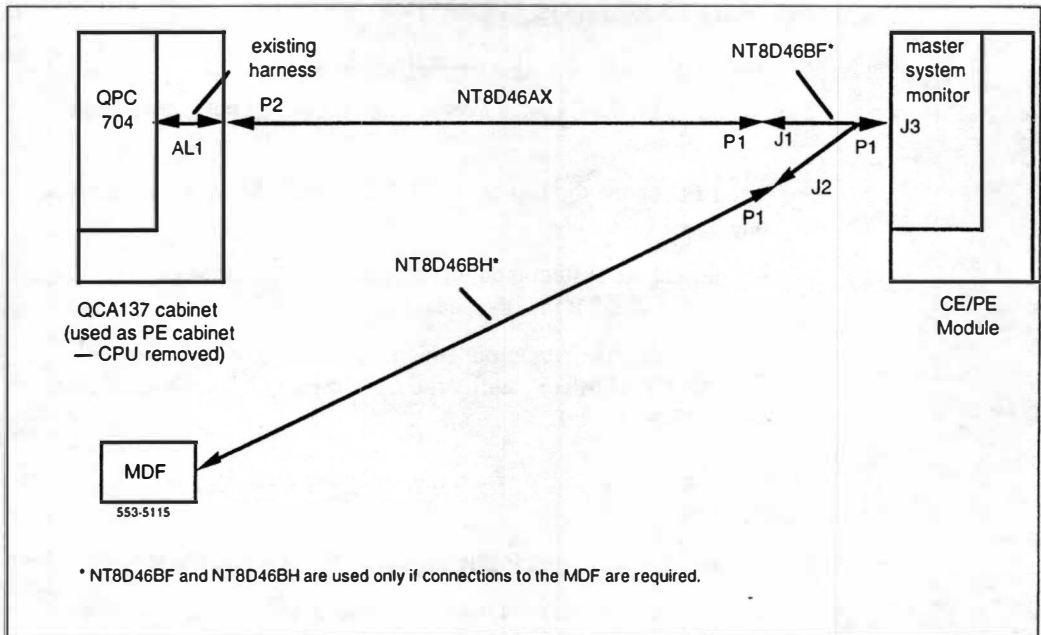
Connecting ST system monitor with QCA137 and CE/PE Module

The following procedure describes how to connect the system monitor in an ST system equipped with a QCA137 cabinet and a CE/PE Module. The CPU is located in the module.

Note: This procedure requires removing the EMI back panel from the cabinet. If alarm monitor connections to the MDF are not required for remote alarm, CE alarm, SYSIN/SYSOUT or power fail transfer, skip steps 1 through 4 and directly install connector P1 of the NT8D46AX cable into connector J3 of the system monitor, ensuring the connections with a screwdriver.

- 1 Install connector P1 of the NT8D46AX cable into connector J1 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 2 Install connector P1 of the NT8D46BF cable into connector J3 of the system monitor. Ensure the connection with a screwdriver.
- 3 Install connector P1 of the NT8D46BH cable into connector J2 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 4 Terminate the other end of the NT8D46BH cable.
- 5 Reinstall the pedestal back panel on the module.
- 6 Remove the QCA137 rear panels.
- 7 Remove the QCA137 EMI back panel. Verify that the GND1 and GND2 cables are tied together on the ground bar at the back of the QUAA3 Power Unit.
- 8 Install connector P2 of the NT8D46AX cable into connector AL1 (P0678258 Filter Connector) at the bottom rear of the QCA137 cabinet. Ensure the connection with a screwdriver.
- 9 Reinstall the EMI back panel.
- 10 Reinstall the QCA137 rear panels.
- 11 Restore power to the cabinet and column by reinserting the removed fuse and resetting all circuit breakers to on. . Verify that all alarm LEDs on the QUAA3 Power Unit are on, except the CE/PE 1 LED which is on after approximately 90 seconds. Verify that the maintenance console displays message:
PWR0055 00 0 0

Figure 18-11
Connecting system monitor — Configuration 2



Fault clearing

After powering up the system and sysloading is complete, wait 90 seconds then verify the following:

- 1 The PFTU (if installed) is not activated.
- 2 All LEDs on the QUAA3 Power Unit stay on. If not, verify cable connections.
- 3 The LED on the top cap of the CE/PE Module is off. If not, perform one of the following:
 - unseat the system monitor, verify the switch settings (Table 18-2), and reinstall it into the pedestal
 - use LD37, Input/Output Diagnostic, and issue the command "STAT XSM" to identify the fault. See *X11 input/output guide* (553-3001-400).

To verify the installation, perform the following optional procedure on the CE/PE Module:

- 1 Locate the blower unit inside the pedestal of the CE/PE Module.
- 2 Set the circuit breaker on the blower unit to off. Verify the following:
 - the LED on the top cap is on
 - all LEDs on the QUAA3 Power Unit stay on.
 - the maintenance console displays message:
PWR0006 FANU 00 0 0
- 3 Set the circuit breaker on the blower unit back on. Verify that the LED on the top cap is off and the maintenance console displays message:
PWR0046 FANU 00 0 0
- 4 Perform a data dump using LD43.
- 5 Perform a sysload on the CE/PE Module. Verify the following:
 - the CE/PE 1 LED on the QUAA3 Power Unit is off
 - the PFTU (if installed) is activated
 - the LED on the top cap of the CE/PE Module is on
 - the LEDs on all ringing generators are off

6 Wait 90 seconds after the sysload, then verify the following:

- the CE/PE 1 LED is on
- the PFTU (if installed) is deactivated
- the LED on the top cap of the CE/PE Module is off
- the LEDs on all ringing generators are on
- the maintenance console displays messages:

PWR0056 PFTU XX X X

PWR0055 XSMC 00 0 0

PWR0000 PWSP XX X X

(for each ringing generator)

To verify the installation, perform the following optional procedure on the QCA137 cabinet:

1 Hardware disable the QPC659 DLB card and verify the following:

- the PE 2-5 LED on the QUAA3 Power Unit is off
- the LED on the top cap of the CE/PE Module is off
- the maintenance console displays message:

PWR0015 XSMC 00 0 0

2 Hardware enable the QPC659 DLB card. Verify that the PE 2-5 LED is on, and the maintenance console displays message:

PWR0055 XSMC 00 0 0

If any test fails, verify that the NT8D46AX cable is installed properly, and the switch settings on the system monitor are correct for this configuration.

Configuration 3

Connecting system monitor ST system with QCA136, QCA137, and CE/PE Module

The following procedure describes how to connect the system monitor in an ST system equipped with a QCA136 cabinet, a QCA137 cabinet, and a CE/PE Module. The CPU is located in the module.

Note: This procedure requires removing the EMI back panels from both cabinets. If alarm monitor connections to the MDF are not required for remote alarm, CE alarm, SYSIN/SYSOUT or power fail transfer, skip steps 1 through 4 and directly install connector P1 of the NT8D46BE cable into connector J3 of the system monitor, ensuring the connections with a screwdriver.

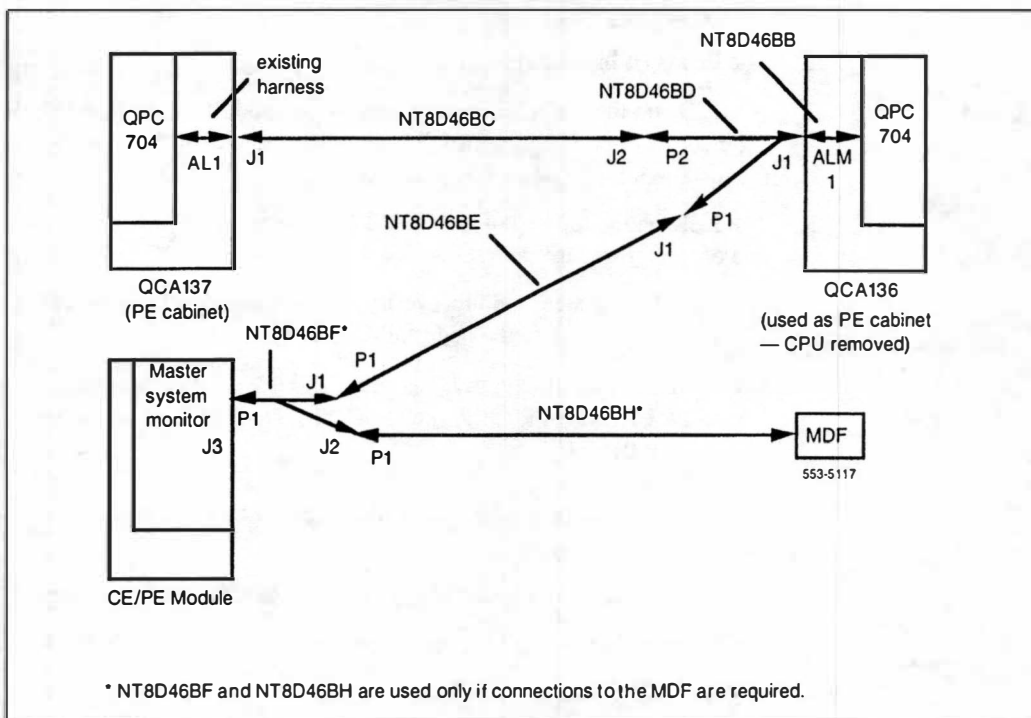
- 1 Install connector P1 of the NT8D46BF cable into connector J3 of the system monitor. Ensure the connection with a screwdriver.
- 2 Install connector P1 of the NT8D46BE cable into connector J1 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 3 Install connector P1 of the NT8D46BH cable into connector J2 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 4 Terminate the other end of the NT8D46BH cable.
- 5 Reinstall the pedestal back panel.
- 6 Remove the QCA136 rear panels.
- 7 Remove the QCA136 EMI back panel. Verify that the GND1 and GND2 cables are tied together on the ground bar at the back of the QUAA3 Power Unit.
- 8 Unplug connector P6 of the existing harness from connector J6 of the QCAD309 Alarm Cable.
- 9 Unplug connector P6 of the QCAD309 Alarm Cable from connector J6 of the QUAA3 Power Unit.
- 10 Unplug connector P4 of the existing harness from connector J4 of the QCAD309 Alarm Cable.
- 11 Unplug connector P4 of the QCAD309 Alarm Cable from connector J4 of the QUAA3 Power Unit.

- 12 Remove connector AL1 of the QCAD309 Alarm Cable from the P0678258 Filter Connector located in one of the three horizontal cutouts at the bottom rear of the QCA136 cabinet.
- 13 Remove the QCA309 Alarm Cable.
- 14 Remove the NE-25MQA1 Alarm Cable connecting the QCA136 and QCA137 cabinets.
- 15 Unplug connector P5 of the existing harness from connector J5 on the rear of the QUAA3 Power Unit.
- 16 Install connector P5 of the NT8D46BB cable into connector J5 on the rear of the QUAA3 Power Unit.
- 17 Install connector J5 of the NT8D46BB cable into connector P5 of the existing harness.
- 18 Install connector P4 of the existing harness into connector J4 on the rear of the QUAA3 Power Unit.
- 19 Unplug connector P6 of the existing harness from connector J6 on the QUAA3 Power Unit.
- 20 Install connector P6 of the NT8D46BB cable into connector J6 on the QUAA3 Power Unit.
- 21 Install connector J6 of the NT8D46BB cable into connector P6 of the existing harness.
- 22 Loosen screws XCE, REMA, and REMB on terminal block TB2 of the QUX19 Power Distribution Unit.
- 23 Connect lug XCE (white wire) from the NT8D46BB cable to screw XCE on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw XCE.
- 24 Connect lug REMA (yellow wire) from the NT8D46BB cable to screw REMA on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw REMA.
- 25 Connect lug REMB (black wire) from the NT8D46BB cable to screw REMB on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw REMB.
- 26 Loosen one of the ground lugs located on the ground bar on the rear of the QUAA3 Power Unit with a 7/16" socket driver.

- 27 Connect the GND ring lug (four black wires) to the loosened ground lug on the rear of the QUAA3 Power Unit and tighten with the socket driver.
- 28 Install connector ALM1 of the NT8D46BB cable into one of the three horizontal cutouts using the existing P0678258 Filter Connector.
- 29 Install connector J1 of the NT8D46BD cable into the P0678258 Filter Connector. Ensure the connection with a screwdriver.
- 30 Install connector J1 of the NT8D46BE cable into connector P1 of the NT8D46BD cable.
- 31 Install connector J2 of the NT8D46BC cable into connector P2 of the NT8D46BD cable. Ensure the connection with a screwdriver.
- 32 Reinstall the QCA136 EMI back panel.
- 33 Reinstall the QCA136 rear panels.
- 34 Remove the QCA137 rear panels. Verify that the QCAD310 cable is installed between the ground bars of the QCA136 and QCA137 cabinets.
- 35 Remove the QCA137 EMI back panel. Verify that the GND1 and GND2 cables are tied together on the ground bar at the back of the QUAA3 Power Unit.
- 36 Install connector J1 of the NT8D46BC cable into connector AL1 (P0678258 Filter Connector) at the bottom rear of the QCA137 cabinet. Ensure the connection with a screwdriver.
- 37 Reinstall the QCA137 EMI back panel.
- 38 Reinstall the QCA137 rear panels.
- 39 Restore power to the cabinet and column by reinserting the removed fuse and resetting all circuit breakers to on. . Verify that all alarm LEDs on the QUAA3 Power Unit are on, except the CE/PE 1 LED which is on after approximately 90 seconds. Verify that the maintenance console displays message:

PWR0055 00 0 0

Figure 18-12
Connecting system monitor — Configuration 3



Fault clearing

After powering up the system and sysloading is complete, wait 90 seconds then verify the following:

- 1 The PFTU (if installed) is not activated.
- 2 All LEDs on the QUAA3 Power Units in the QCA136 and QCA137 cabinets stay on. If not, verify that steps 10, 11, and 14 through 33 of the installation procedure have been completed.
- 3 The LED on the top cap of the CE/PE Module is off. If not, perform one of the following:
 - unseat the system monitor, verify the switch settings (Table 18-2), and reinstall it into the pedestal
 - use LD37, Input/Output Diagnostic, and issue the command "STAT XSM" to identify the fault. See *X11 input/output guide* (553-3001-400).

To verify the installation, perform the following optional procedure on the CE/PE Module:

- 1 Locate the blower unit inside the pedestal of the CE/PE Module.
- 2 Set the circuit breaker on the blower unit to off. Verify the following:
 - the LED on the top cap is on,
 - all LEDs on the QUAA3 Power Units of the QCA136 and QCA137 cabinets stay on
 - the maintenance console displays message:
PWR0006 FANU 00 0 0
- 3 Set the circuit breaker on the blower unit back on. Verify that the LED on the top cap is off and the maintenance console displays message:
PWR0046 FANU 00 0 0
- 4 Perform a data dump using LD43.
- 5 Perform a sysload on the CE/PE Module. Verify the following:
 - all CE/PE 1 LEDs are off
 - the PFTU (if installed) is activated
 - the LED on the top cap of the CE/PE Module is on
 - the LEDs on all ringing generators are off

6 Wait 90 seconds after the sysload, then verify the following:

- all CE/PE 1 LEDs are on
- the PFTU (if installed) is deactivated
- the LED on the top cap of the CE/PE Module is off
- the LEDs on all ringing generators are on
- the maintenance console displays messages:

PWR0056 PFTU XX X X
PWR0055 XSMC 00 0 0
PWR0000 PWSP XX X X
(for each ringing generator)

To verify the installation, perform the following optional procedure on the QCA136 cabinet:

1 Hardware disable the QPC659 DLB card and verify the following:

- the PE 2-5 LEDs on the QUAA3 Power Units of the QCA136 and QCA137 cabinets stay on
- the LED on the top cap of the PE Module stays off
- the maintenance console displays message:

PWR0015 XSMC 00 0 0

2 Hardware enable the QPC659 DLB card and verify that the PE 2-5 LEDs on the QUAA3 Power Units of the QCA136 and QCA137 cabinets are on. Verify that the maintenance console displays message:

PWR0055 XSMC 00 0 0

To verify the installation, perform the following optional procedure on the QCA137 cabinet:

1 Hardware disable the QPC659 DLB card and verify the following:

- the PE 2-5 LED on the QUAA3 Power Unit of the QCA137 cabinet is off
- the PE 2-5 LED on the QUAA3 Power Unit of the QCA136 cabinet stays on
- the LED on the top cap of the CE/PE Module stays off
- the maintenance console displays message:

PWR0015 XSMC 00 0 0

2 Hardware enable the QPC659 DLB card and verify that the PE 2-5 LEDs on the QUAA3 Power Units of the QCA136 and QCA137 cabinets are on. Verify that the maintenance console displays message:

PWR0055 XSMC 00 0 0

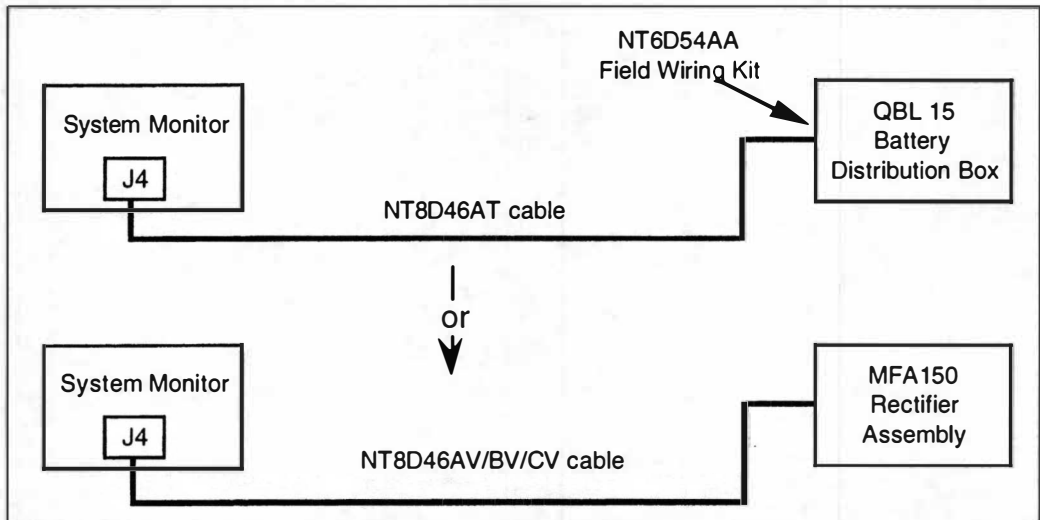
If any test fails, verify that all cables are installed properly, and the switch settings on the system monitor are correct for this configuration. On the QCA137 cabinet, verify the installation of the QCAD310 cable.

To remove equipment no longer required

- 1** Disconnect and remove cables from connectors on the faceplates of the circuit cards located on the CE shelf.
- 2** Remove circuit cards from the CE shelf and store them in a safe place.
- 3** Remove the mass storage unit from the QCA136 cabinet.
- 4** If you are using the CE shelf for DTI/PRI cards:
 - Install DTI/PRI cards in CE shelf card slots 3, 5, 7, 9, and 11.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the CPU/Network module of the Option 21E upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breaker for the CE shelf to ON.

- 5 If you are not going to use the CE shelf for DTI/PRI cards:
 - Install the power load card (NT6D81AA) in the CE shelf card slots 2 through 11.
- 6 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Figure 18-13
NT8D46 cable types



Meridian 1 NT6D39 module upgrade to Meridian 1 Option 51

This procedure describes how to upgrade a Meridian 1 Option 51 (with an NT6D39 module, running release 15 through 17) to a Meridian 1 Option 51 running release 20 . To upgrade to a Meridian 1 Option 51 system running release 20 , you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 51 is operating with the new software provided with the Option 51.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Card upgrade of an NT6D39 module (51 RIs 15-17) to Meridian 1 Option 51

Equipment required

Table 19-1 lists minimum hardware requirements needed for a card level upgrade of an NT6D39 module to a Meridian 1 Option 51.

Table 19-1

Minimum hardware requirements for a Meridian 1 Option 51

DC system	Part Number	Description
1	NTND08AA RIs 2	Daughter board (ROM)
1	NTND09CA	12 Mb Memory Pack
1	NTND10AA RIs 5	Changeover and Memory Arbitrator (CMA)
1	NTND16AA RIs 2	Multi Disk Unit (MDU)
1	QPC584L Series B	Multi Disk Interface Pack (MDI)
1	NT8D80AD	Cable (MDU to MDI)

Note: The vintages shown on circuit cards in Table 19-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

Summary of steps to upgrade

Upgrading consists of:

- removal of CMA, MEM, MSI or FDI, and MDU or FDU
- installation of new equipment and cables
- sysload

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

Removal of CMA, MEM, MSI or FDI, and MDU or FDU

To remove cards:

- 1 Remove software disks from Multi Disk Unit or the Floppy Disk Unit.
 - 2 Disconnect the cable from the faceplate of the FDI/FDU or MSI/MDU.
 - 3 Set the ENB/DIS faceplate switch to DIS on the FDI or MSI.
 - 4 Remove the FDI or MSI.
 - 5 Set the ENB/DIS faceplate switch to DIS on the CMA (QPC581).
 - 6 Remove the CMA (QPC581).
 - 7 Remove the MEM (QPC583).
-

Installing new equipment

To install the cards and cables:

- 1 Install the NTND10AA CMA card:
 - Set the ENB/DIS switch to DIS on the CMA card.
 - Connect pins 1 and 2 on the jumper at J3 on the CMA card.
 - Insert the NTND10 CMA card.
 - Set the ENB/DIS switch to ENB on the CMA card.
- 2 Insert the NTND09 Memory card.
- 3 Install the NTND08 ROM card:
 - Set the ENB/DIS switch to DIS on the QPC580 CPU Interface card.

- Disconnect the cable between the QPC579 CPU Function card and the QPC580 CPU Interface card.
- Remove the CPU Function card.
- Unplug the existing ROM card from connectors on the component side of the CPU Function card.

CAUTION

When you remove the ROM card, do not touch other components on the QPC579 CPU Function card.

- Plug the NTND08 ROM card into connectors on the component side of the CPU Function card.
 - Reinstall the CPU Function card.
 - Connect the cable between the CPU Function card and the CPU Interface card.
 - Set the ENB/DIS switch to ENB on the CPU Interface card.
- 4 Set the ENB/DIS switch on QPC584L MSI cards to DIS.
 - 5 On QPC584L MSI card, set positions 1, 5, and 7 on switch 3 to ON.
Note: On QPC584L MSI card, set position 4 to OFF at this point. After the database is transferred, position 4 will be reset to ON.
 - 6 With the ENB/DIS switch set to DIS and the appropriate cartridge installed insert the MSI card into its assigned position.
 - 7 Insert the MDU into its assigned position.

If the disk drive unit must be located close to a 5/12 V converter card, install the EMI shield (P067761), which is provided in the upgrade package, between the shelf rails next to the power converter card.
 - 8 Connect an NT8D80 cable between faceplate connector 0 on the MDU and the faceplate connector on the QPC584L MSI card.
 - 9 Insert target data disks labeled "ED" into floppy disk drives.
 - 10 Set the ENB/DIS switch on each MSI card to ENB.

Sysload

Before you activate the system, review installation steps and verify that all circuit cards are in appropriate card slots, ENB/DIS switches are set to ENB, and all cables are properly connected.

To SYSLOAD the system:

- 1 Make sure the NORM/MAINT switch on the CPU interface card is set to NORM.
- 2 Start SYSLOAD by pressing the RLD button on the CMA card.

When the SYSLOAD is done the upgrade is complete.

Upgrading to
Option 51C

SL-1 QCA6 cabinet upgrade to Meridian 1 Option 51C

This procedure is used to upgrade an SL-1 QCA6 cabinet (L or LE) to Meridian 1 Option 51C. To upgrade to a Meridian 1 Option 51C system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51C:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51C operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 51C is operating with the new software provided with it.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51C operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Modular Upgrade of an SL-1QCA6 cabinet (L or LE) to Meridian 1 Option 51C

Equipment required

Table 20-1 lists minimum hardware requirements needed to upgrade a QCA6 cabinet to a DC powered Meridian 1 Option 51C system.

Table 20-1

Minimum hardware requirements for a Meridian 1 Option 51C

Quantity			
AC System	DC System	Part number	Description
	1	NT6D41AB	CE Power Supply DC
1	1	NT6D63AA	Input/Output Processor (IO) Pack
1	1	NT6D64AA	Core Multi-Drive Unit (CMDU)
1	1	NT6D65AA	Core Network Interface (CNI) Pack
1	1	NT6D66AA	Call Processor (CP) Pack
1	1	NT6D6003	Core Bus Terminator (CBT) Pack
1		NT7D00AA	Top Cap AC
	1	NT7D00BA Rls 2	Top Cap DC
	1	NT7D09CA	Pedestal DC
	1	NT7D10CA	System Monitor Panel Assembly
	1	NT7D67CA	Power Distribution Unit and filter assembly
1	1	NT8D17AA Rls 9	Conference/TDS Card
1	1	NT8D22AC	System Monitor
1		NT8D27AB Rls 3	Pedestal AC
1		NT8D29AA Rls 4	CE/PE power supply AC
1	1	NT8D41AA Rls 2	2 Port SDI Paddle Board
1	1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	1	NT8D46BH	System Monitor to MDF Cable
-continued-			

Table 20-1 (continued)**Minimum hardware requirements for a Meridian 1 Option 51C**

Quantity			
AC System	DC System	Part number	Description
1		NT8D52AA	Pedestal Blower unit AC
	1	NT8D52DC	Pedestal Blower Unit DC
1		NT8D53AB Rls 5	Power Distribution Unit AC
1	1	NT8D84AA	SDI Paddle Board to I/O Cable
	1	NT8D85AZ	CMA to CMA, 5 ft (1520 mm)
1	1	NT8D80AZ	CMA to CMA, 5 ft (1520 mm)
1	1	NT8D93AJ	SDI Paddle Board I/O to DTE/DCE, 16 ft (4875 mm)
1	1	NT8D99AB	Network to Network Module Cable 2 ft (610 mm)
1	1	NT9D11DC	Core Network (CN) Module
1	1	QPC43R	Peripheral Signaling Card
	1	QPC84Q	Power Monitor
1	1	QPC441B Series D	3 Port Extender Card
1	1	QPC477-9A	Bus Terminating Units
1	1	QPC477-10B	Bus Terminating Units

Note: The vintages shown on circuit cards in Table 20-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA6 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 51C Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 51C to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 51C to the existing cabinet.
- A second NT8D86 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Note: The second NT8D86 cable is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as a QCA7 or 8) do not require the second NT8D86 cable since the NT8D73 cable can be connected directly to the Peripheral Buffer card. For existing cabinets equipped to suppress EMI, refer to 553-3001-150, *Upgrade Engineering*.

Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 51C system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 20-1 shows a typical QCA6 cabinet and Figure 20-2 shows a QCA6 cabinet that has been upgraded to Meridian 1 Option 51C.

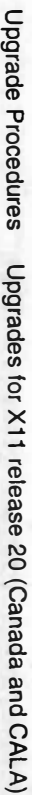
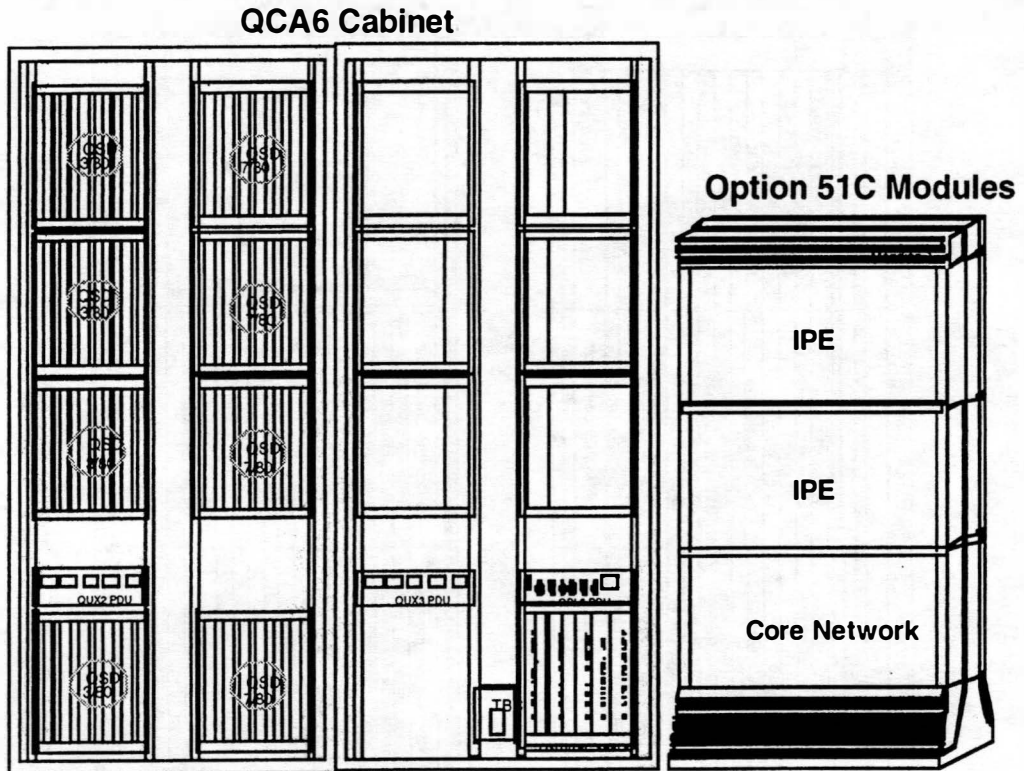


Figure 20-2

Typical QCA6 cabinet that has been upgraded to Meridian 1 Option 51C



Installing the Meridian 1 Option 51C system

The Option 51C equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, Core Network modules, IPE module, circuit cards, and top cap. CMDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 51C equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 20-2 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.
- Install cabling:
 - Cable common equipment

- Cable network loops (within the Option 51C columns only).

Note: Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.

- Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 51C equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 20-3 shows Option 51C circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 20-2**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 20-2 (continued)**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 20-2 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves				Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."					
For each slave, indicates the slave address				Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."					
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master			on					
	slave			off					
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

Table 20-2 (continued)

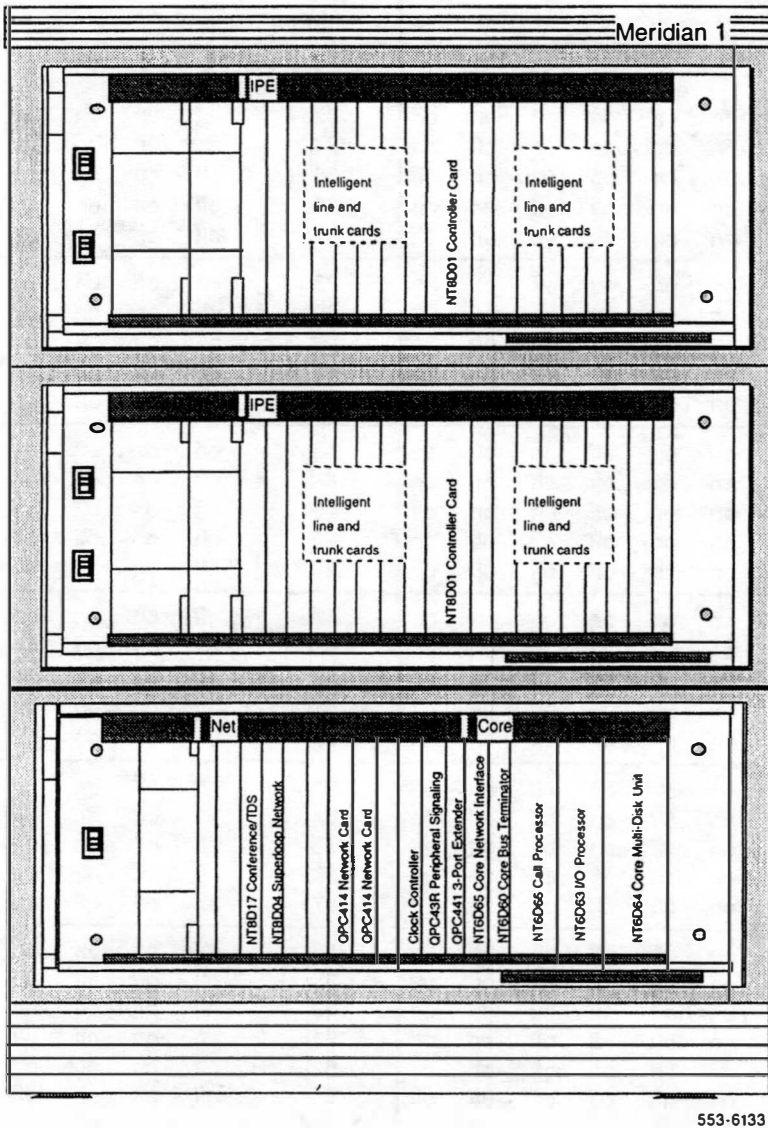
NT8D22 system monitor — settings for total number of slaves — SW2 on master

How many slave units		Switch position						How many slave units		Switch position					
		3	4	5	6	7	8			3	4	5	6	7	8
0		on	on	on	on	on	on	32		off	on	on	on	on	on
1		on	on	on	on	on	off	33		off	on	on	on	on	off
2		on	on	on	on	off	on	34		off	on	on	on	off	on
3		on	on	on	on	off	off	35		off	on	on	on	off	off
4		on	on	on	off	on	on	36		off	on	on	off	on	on
5		on	on	on	off	on	off	37		off	on	on	off	on	off
6		on	on	on	off	off	on	38		off	on	on	off	off	on
7		on	on	on	off	off	off	39		off	on	on	off	off	off
8		on	on	off	on	on	on	40		off	on	off	on	on	on
9		on	on	off	on	on	off	41		off	on	off	on	on	off
10		on	on	off	on	off	on	42		off	on	off	on	off	on
11		on	on	off	on	off	off	43		off	on	off	on	off	off
12		on	on	off	off	on	on	44		off	on	off	off	on	on
13		on	on	off	off	on	off	45		off	on	off	off	on	off
14		on	on	off	off	off	on	46		off	on	off	off	off	on
15		on	on	off	off	off	off	47		off	on	off	off	off	off
16		on	off	on	on	on	on	48		off	off	on	on	on	on
17		on	off	on	on	on	off	49		off	off	on	on	on	off
18		on	off	on	on	off	on	50		off	off	on	on	off	on
19		on	off	on	on	off	off	51		off	off	on	on	off	off
20		on	off	on	off	on	on	52		off	off	on	off	on	on
21		on	off	on	off	on	off	53		off	off	on	off	on	off
22		on	off	on	off	off	on	54		off	off	on	off	off	on
23		on	off	on	off	off	off	55		off	off	on	off	off	off
24		on	off	off	on	on	on	56		off	off	off	on	on	on
25		on	off	off	on	on	off	57		off	off	off	on	on	off
26		on	off	off	on	off	on	58		off	off	off	on	off	on
27		on	off	off	on	off	off	59		off	off	off	on	off	off
28		on	off	off	off	on	on	60		off	off	off	off	on	on
29		on	off	off	off	on	off	61		off	off	off	off	on	off
30		on	off	off	off	off	on	62		off	off	off	off	off	on
31		on	off	off	off	off	off	63		off	off	off	off	off	off
— continued —															

Table 20-2 (continued)
NT8D22 system monitor — slave address — SW2 on slave

Slave unit address							Position							Slave unit address							Position						
							3	4	5	6	7	8								3	4	5	6	7	8		
1	on	on	on	on	on	off	33	off	on	on	on	on	on	off	on	34	off	on	on	on	on	off	on				
2	on	on	on	on	off	on	35	off	on	on	on	on	off	off	36	off	on	on	off	on	on	on					
3	on	on	on	on	off	off	37	off	on	on	off	on	on	off	38	off	on	on	off	off	on	on					
4	on	on	on	off	on	on	39	off	on	on	off	on	on	on	40	off	on	off	on	on	on	on					
5	on	on	on	off	on	off	41	off	on	off	on	on	off	off	42	off	on	off	on	on	off	on					
6	on	on	on	off	off	on	43	off	on	off	on	off	off	on	44	off	on	off	off	on	on	on					
7	on	on	on	off	off	off	45	off	on	off	off	on	on	on	46	off	on	off	off	on	off	on					
8	on	on	off	on	on	on	47	off	on	off	off	off	on	on	48	off	on	off	off	off	on	on					
9	on	on	off	on	on	off	49	off	on	off	on	off	off	off	50	off	on	off	off	off	off	on					
10	on	on	off	on	off	on	51	off	on	off	off	off	off	off	52	off	on	off	off	on	on	on					
11	on	on	off	on	off	off	53	off	on	off	on	off	off	off	54	off	on	off	off	off	off	on					
12	on	on	off	off	on	on	55	off	on	off	off	on	on	on	56	off	on	off	off	off	off	on					
13	on	on	off	off	on	off	57	off	on	off	off	off	on	on	58	off	on	off	off	off	off	on					
14	on	on	off	off	off	on	59	off	on	off	off	off	off	off	60	off	on	off	off	off	off	on					
15	on	on	off	off	off	off	61	off	on	off	off	off	off	off	62	off	on	off	off	off	off	on					
16	on	off	on	on	on	on	63	off	on	off	off	off	off	off	63	off	on	off	off	off	off	on					
17	on	off	on	on	on	off																					
18	on	off	on	on	off	on																					
19	on	off	on	on	off	off																					
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24	on	off	off	on	on	on																					
25	on	off	off	on	on	off																					
26	on	off	off	on	off	on																					
27	on	off	off	on	off	off																					
28	on	off	off	off	on	on																					
29	on	off	off	off	on	off																					
30	on	off	off	off	off	on																					
31	on	off	off	off	off	off																					
32	off	on	on	on	on	on																					

Figure 20-3
Meridian 1 Option 51C Core Network and IPE modules



Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 51C: one designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 51C, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Note: Depending on the power configuration used it may be required to do modifications to the existing cabinets. If modifications are required, do them as part of the cut-over procedures (described later in this document) to avoid unnecessary interruption of service to the end users.

Connect the DC power to the Option 51C columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 51C equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 51C module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 51C modules.

- a new power source installed in conjunction with the Option 51C.

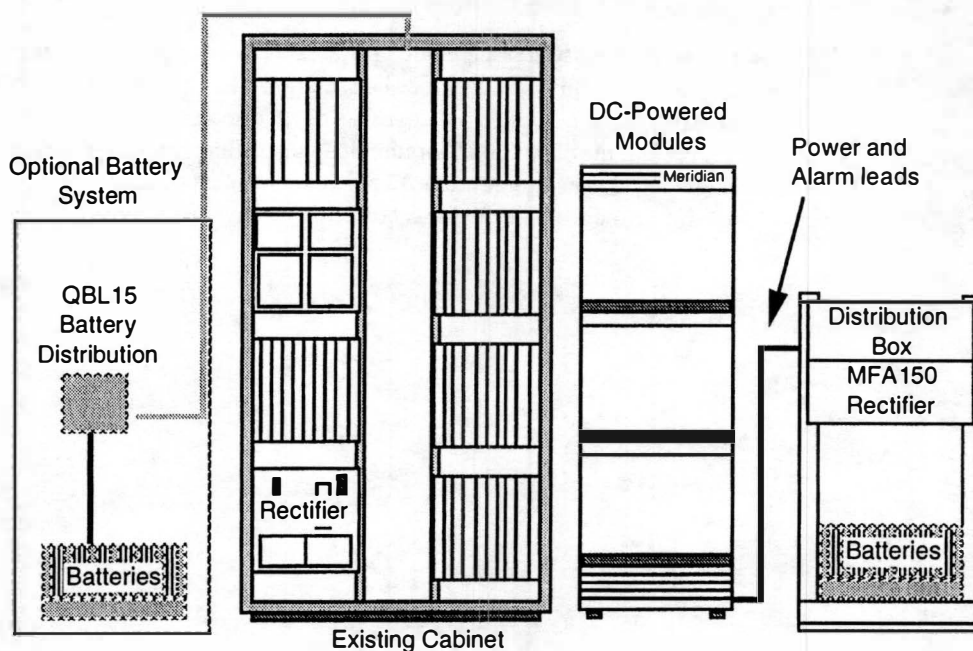
To determine the power requirements for the Option 51C system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 20-4 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 51C modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 51C column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 20-4

Typical arrangement of independently DC-powered Meridian 1 Option 51C modules

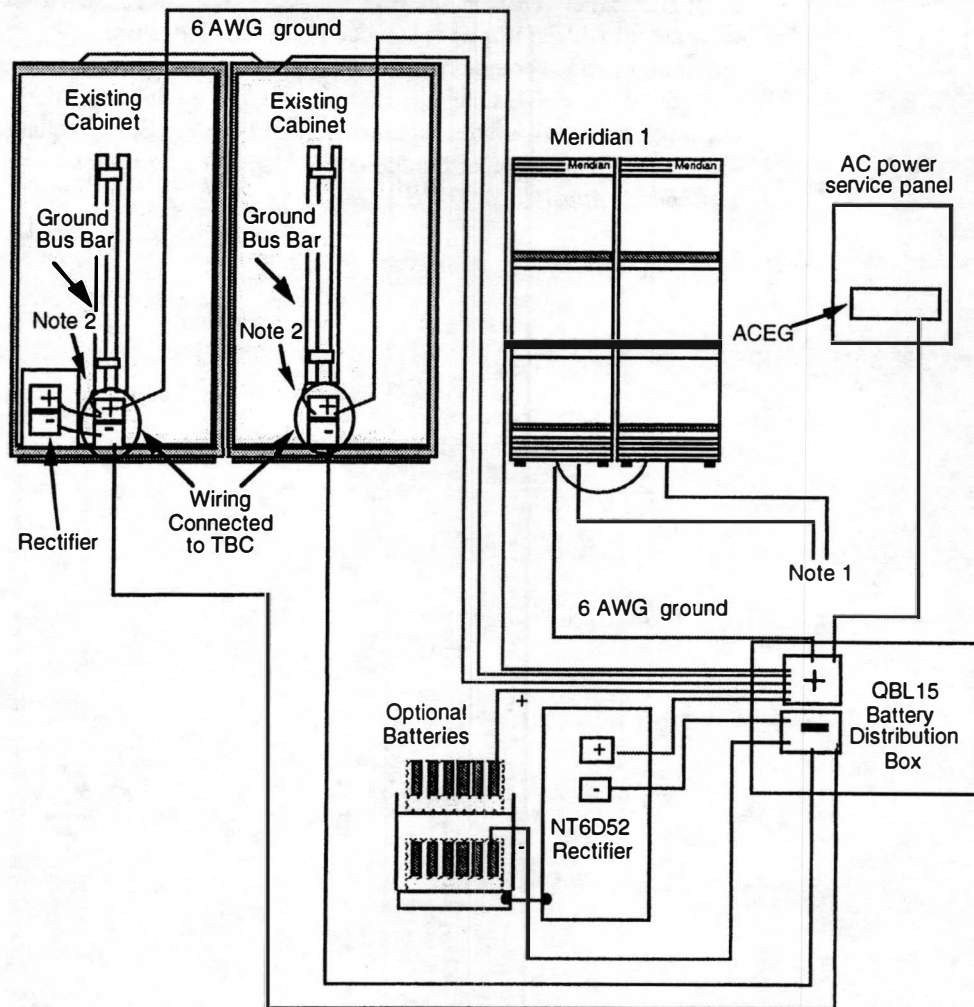


Note: An MFA150 cannot share a battery string connected to QBL15, QBL12 or QCA13. A separate battery string is required for the MFA150.

Common power source

Existing cabinet rectifier as a common power source

- When the existing cabinet DC power source is used as a common power source for the cabinet and the column, any QSD4 rectifier will have to be replaced with a QRF8 rectifier and the existing battery distribution box will have to be replaced with a QBL15 battery distribution box. For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 20-5 illustrates a common power supply arrangement for the upgraded system. This includes both Option 51C modules and the existing cabinet. Option 51C consists of a Core Network module and an IPE module. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

Figure 20-5**Typical arrangement using a common DC power supply with optional battery backup**

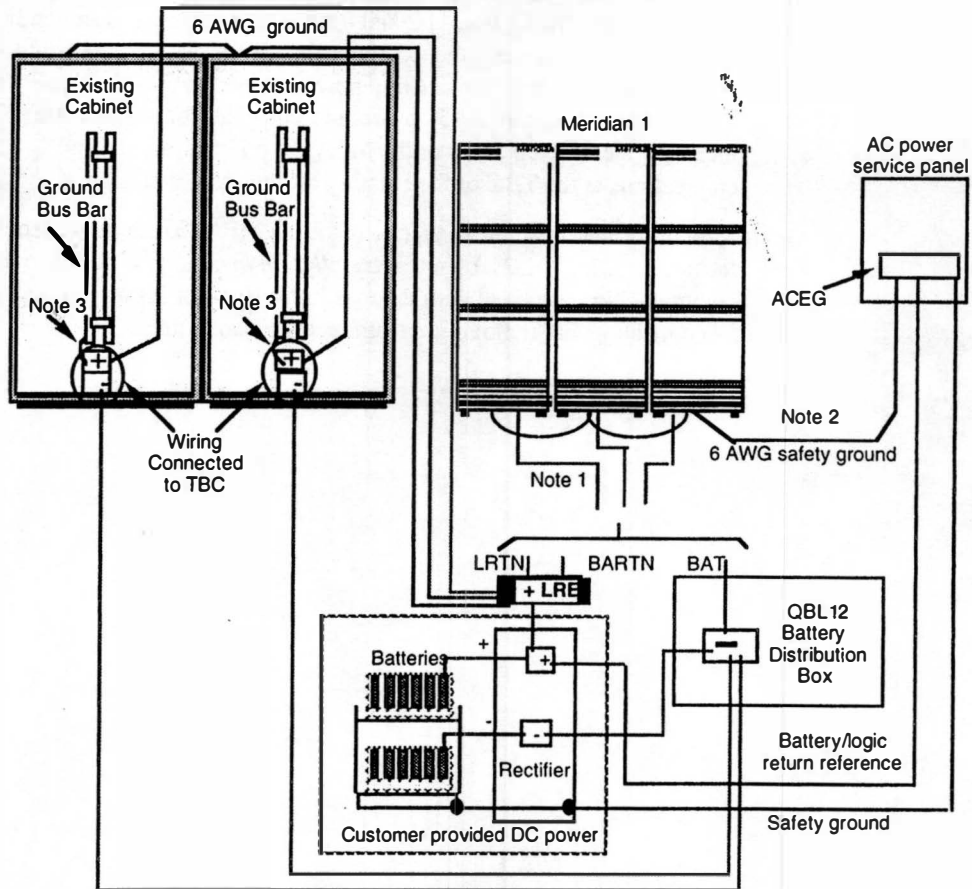
Note 1: DC power feeds from the QBL15 to the Meridian 1. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

Note 2: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

Customer provided power as a common power source

- A QBL12 Battery Distribution Box is normally used to connect to a customer provided DC power source. Figure 20-6 illustrates a customer provided common power supply arrangement for the upgraded system. This includes both Option 51C modules and the existing cabinet. A full description of QBL12 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 20-6**Typical arrangement using a customer provided common DC power supply**

Note 1: DC power feeds. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

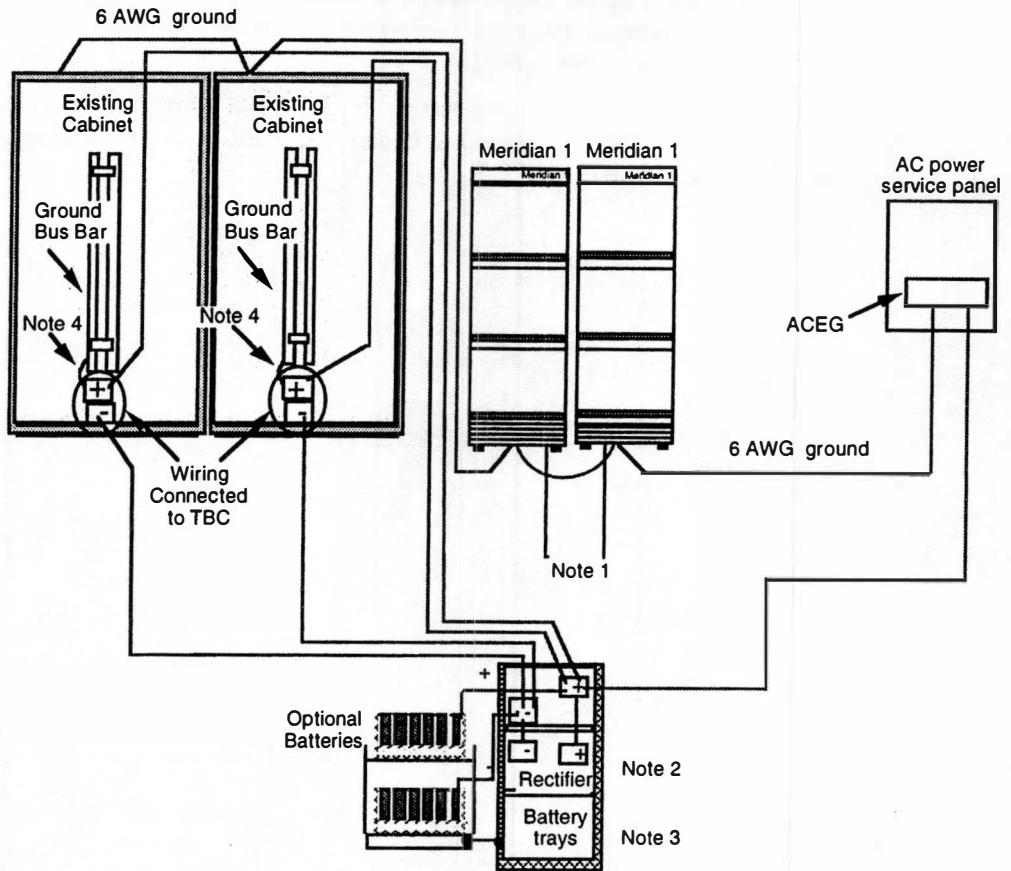
Note 2: With customer provided power equipment, the Meridian 1 frame requires a direct connection to the ACEG. In addition, the positive bus bar in the customer provided equipment must connect to the ACEG.

Note 3: WARNING—Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

An MFA150 power system as a common power source

- An MFA150 power system assembly can be used as a common power source for both the Option 51C and the existing cabinets as shown in Figure 20-7. To connect the existing cabinets, disconnect the + and - 48V power leads from the existing power source, then reroute and connect them to the MFA150 power system. The connections are located under the top cover of the MFA150 power system. The connections at the TBC of the existing cabinet do not change.
- More information about connections for the MFA150 power system is located in 553-3001-210, *System installation procedures*. Refer to the documentation provided with the existing system for information about disconnecting and removing the old rectifier and batteries.

Figure 20-7**Typical arrangement using an MFA150 power system as a common power source**

Note 1: DC power feeds from the MFA150 to the Meridian 1. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

Note 2: The MFA150 power system may be equipped with one or two power shelves for a maximum of 75 amps or 150 amps respectively.

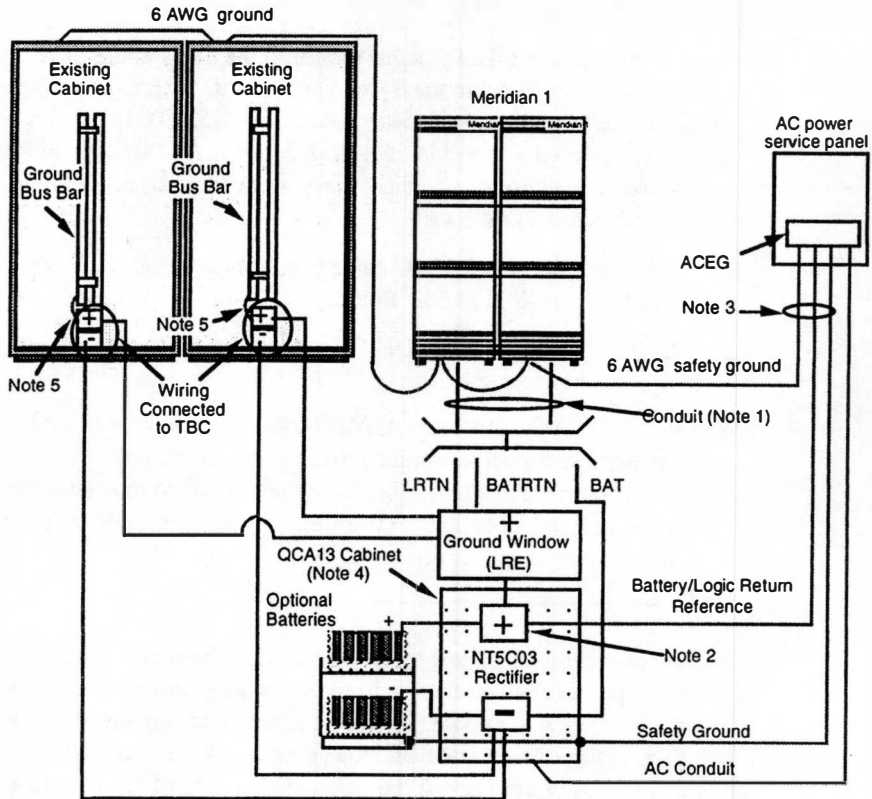
Note 3: Batteries may be installed in two optional battery trays located under the rectifier shelves.

Note 4: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

An existing QCA13 power cabinet as a common power source

- A QCA13 power cabinet equipped with rectifiers can be used as a common power source for both the Option 51C and the existing cabinets as shown in Figure 20-8.
- For information about connections for the QCA13 power cabinet, refer to 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 20-8**Typical arrangement using a QCA13 as a common power source**

Note 1: DC power feeds to Meridian 1 pedestals. Each feed consists of two BAT (-), two BATRTN (+), and one LRTN (+) conductors. If required, conductors can be run in conduit as shown. BAT (-) connects to the appropriate fuse in the rectifier cabinet.

Note 2: The QCA 13 cabinet does not contain a bus for terminating individual battery and logic returns. A ground window should be used to consolidate all battery and logic returns.

Note 3: The Battery/Logic Return Reference wiring and the safety ground wiring must be #6 AWG, minimum.

Note 4: Up to four NT5C03 rectifiers can be equipped in a QCA13 cabinet for a total of 200 amps.

Note 5: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 51C modules.

These cables connect the System Monitor to the SDI Paddle Board in the Core Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section '**Separate power source**' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/SB/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 20-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 51C system:

- 1 Power up and initially load the Option 51C column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.

- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
- 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
- 4 The Meridian 1 Option 51C system is now operational.

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 51C column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 Connect an NT8D86 cable between the connector on the faceplate of the network card and the I/O panel of the Option 51C. One cable is required for each network loop.
- 2 Connect an NT8D73 shielded cable, up to 30 ft (9 m) in length, to the connector on the I/O panel of the Option 51C. Route the NT8D73 cable to the existing cabinet. Do not connect it to the Peripheral Buffer card in the existing cabinet at this time.

Note: Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

- 3 If required in the existing cabinet (see Note) connect an NT8D86 cable to the connector on the NT8D73 shielded cable from the Option 51C. Make sure that the connectors are locked together with the locking devices. Do not connect the cable to the faceplate of the Peripheral Buffer card at this time. It will be connected as part of the cutover procedure.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable. The NT8D73 shielded cable can be connected directly to the connector of the Peripheral Buffer card.

—OR—

If the existing cabinet is equipped to suppress EMI, the NT8D73 shielded cable should be connected to its assigned filter connector. See 553-3001-150, *Upgrade Engineering* for more information.

Cutting-over

The following procedure describes how to cut-over to the Option 51C system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL12 or QCA13 unit**
Remove the fuses from the -48V fuse panel corresponding to each cabinet and column.
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.

Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.

 - **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
- 2 If required, perform power modifications to the existing cabinets.

- 3 In the existing cabinets, remove the wiring connecting the frame of the cabinet to the positive (+) connection of the TBC, and the wiring connecting the frame to the cabinet ground bus bar. Refer to Figures 20-5 through 20-7.

Note: This wiring was factory installed. It must be removed to avoid ground loops when existing cabinets are used with Meridian 1 modules.

- 4 This step applies only to Meridian 1 modules connected to a DC power source.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 20-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
 - the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.
- 5 This step applies only if a new common power source with battery backup connected to a QBL12, QBL15 or QCA13 battery distribution box is to be used.

Note: This step does not apply if the common power source uses an MFA150 power system.

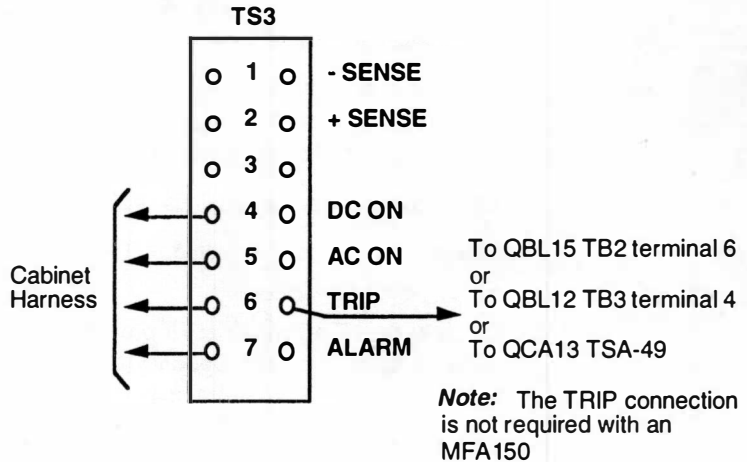
A TRIP lead must be connected to the TRIP connection on:

- the TRIP terminal on the terminal strip on the rectifier in existing cabinets equipped with a rectifier.
- the TRIP terminal of TS3 in existing cabinets not equipped with a rectifier.

The TRIP leads must be connected as follows.

If the existing rectifier is being removed from the cabinet, make the following wiring changes.

- a) If not already connected to TS3, tag and move the cabinet harness DC ON, AC ON, TRIP and ALARM leads presently connected on the rectifier to TS3 as shown in the above drawing. Depending on the type of existing cabinet, the TS3 is located either on the cabinet's TBC block, or on the QUT3 power unit.



- b) Install and connect a 16 AWG wire from terminal 6 (TRIP) on TS3 to the TRIP connection in the QBL12, QBL15 or QCA13 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connections in each cabinet with 16 AWG wire.
- c) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.

Note: The DC ON, AC ON and ALARM lead functions are performed by the Meridian 1 module. Leaving these leads connected in the existing cabinets only extends the alarm indicators to the QPC84 power monitors. If you wish, you may leave these leads disconnected. However, the TRIP lead must be connected.

If the existing rectifier is to remain in the cabinet, make the following wiring changes.

- a) Install and connect a 16 AWG wire from the TRIP connection on the terminal strip of the rectifier to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connection on the terminal strip of the rectifier in each cabinet with 16 AWG wire. In existing cabinets not equipped with a rectifier (such as a QCA7 cabinet powered by a QCA8 cabinet), 'daisy chain' to the TRIP connection on TS3.
 - b) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.
- 6 Cross-connect the alarm cables as shown in Figure 20-10.
 - 7 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.
 - 8 Connect the NT8D86 cables (if provided) or NT8D73 shielded network cables from the Option 51C to the connector on the faceplate of the Peripheral Buffer circuit card in the existing cabinets.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable. The NT8D73 shielded cable can be connected directly to the connector on the faceplate of the Peripheral Buffer card.

—OR—

If the existing cabinet is equipped to suppress EMI, the NT8D73 shielded cable should be connected to its assigned filter connector. See 553-3001-150, *Upgrade Engineering* for more information.

- 9 Remove the QPC84 Power Monitor from the QCA6 cabinet and set switch C11, position 2 to ON. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required. Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.

Note: Disregard any remaining alarm indications. Alarm indications should return to normal once the upgrade is completed and equipment that is no longer required has been removed as described later in this chapter.

- 10 Restore power to the cabinets and column by reinserting the removed fuse and resetting all circuit breakers to ON.

CAUTION

Do not remove the NT8D22 system monitor (XSM) from the column while the system is in service. Removing the XSM may cause the input circuit breakers on the existing cabinets to trip.

- 11 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Figure 20-9
NT8D46 cable types

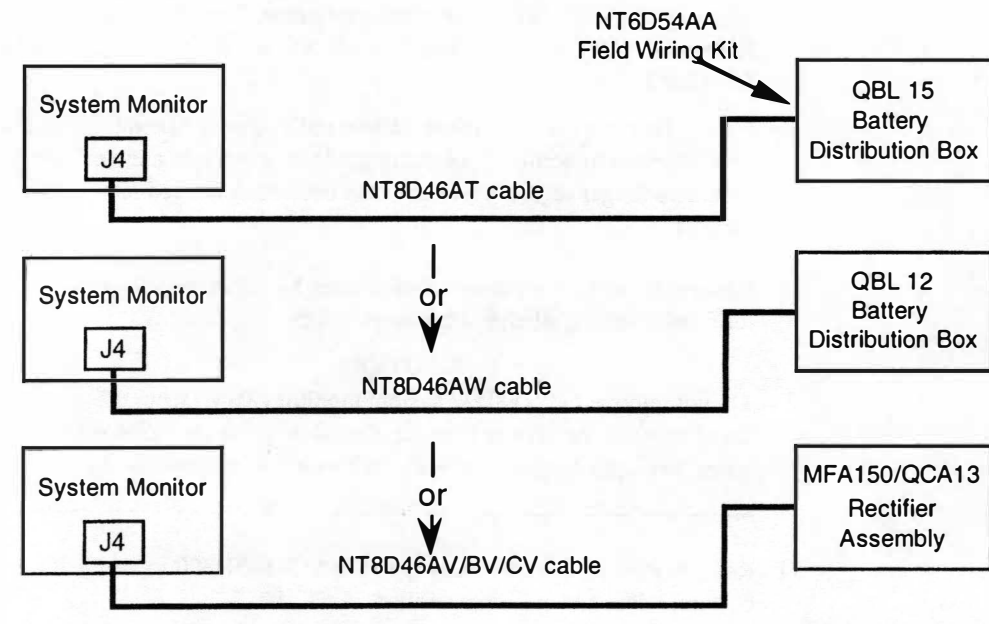
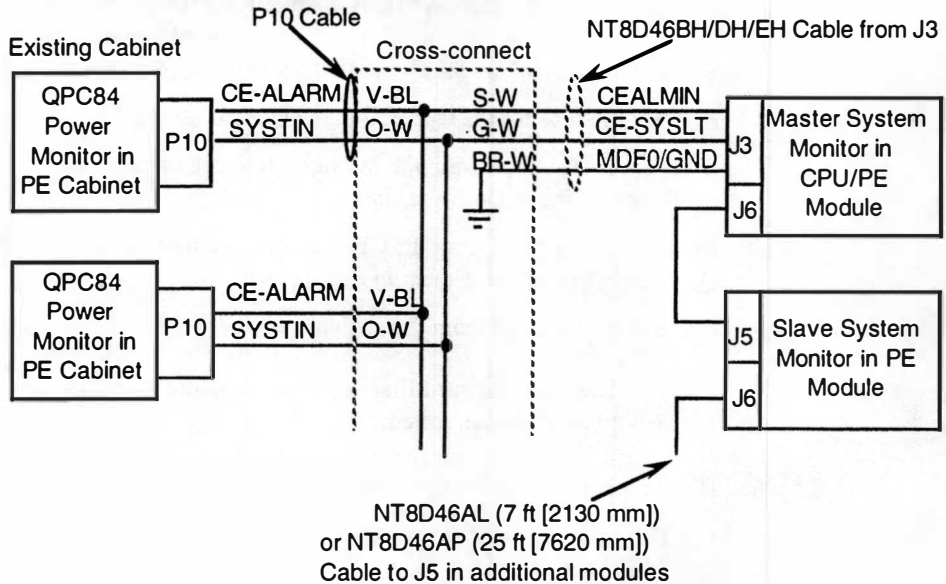


Figure 20-10
Connecting alarm cables between a cabinet and a column



Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

Removing equipment no longer required

The following procedure describes how to remove the equipment that is no longer required once the Option 51C is operating normally.

- 1 Set the circuit breakers for all the shelves in the QCA6 cabinet to OFF.
- 2 Remove the fuse for the tape unit in the QCA6 cabinet.
- 3 Disconnect the cables from the faceplate connectors on all the circuit cards located in the QCA6 cabinet.
- 4 Remove circuit cards from the CE, network and memory shelves in the QCA6 cabinet and store them in a safe place.
- 5 Remove the tape unit from the cabinet.

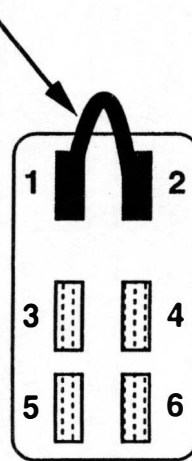
Note: The tape unit must first be removed before the tape unit connector can be disconnected.

- 6 Disconnect power and alarm connections:
 - Disconnect all alarm connectors from the harness to the CPU/MEM shelf.
 - Unplug the power converter card and all common equipment circuit cards from each CPU/MEM shelf.
 - Disconnect power connections and the power monitor connector from the cabinet power distribution harness on the backplane of each CPU/MEM shelf.
- 7 If you are using Network shelves for DTI/PRI cards:
 - Install the DTI/PRI cards in Network shelf card slots 1, 3, 5, 7, 9, and 11.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the Core Network module of the Option 51C upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breakers for the Network shelves to ON.
- 8 If you are not going to use Network shelves for DTI/PRI cards:
 - Disconnect the alarm connector from the harness to each Network shelf.

- Unplug the power converter card from each Network shelf.
- Disconnect power connections and the power monitor connector from the cabinet power distribution harness on the backplane on each Network shelf.
- Tape all exposed power leads with electrical insulation tape
- Disconnect and remove the QUD1 cooling units. Place a jumper (a piece of 24 or 26 AWG bare wire or a paper clip can be used) across power monitor leads 1 and 2 of the cooling unit power connector as shown in Figure 20-11. This disables the alarm for the removed cooling unit.

Figure 20-11
Cooling unit alarm connection

Jumper



Cooling unit connector on
cabinet power distribution harness

SL-1 QCA23 cabinet upgrade to Meridian 1 Option 51C

This procedure is used to upgrade an SL-1 QCA23 cabinet (NT, LE, N, NT, ST, or Options 21, 21E, or 51) with release 15 to 17 software to a Meridian 1 Option 51C Rls 20. To upgrade to a Meridian 1 Option 51C Rls 20 system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware using the card upgrade method and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51C Rls 20:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51C Rls 20 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 51C is operating with the new software provided with it.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51C Rls 20 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Modular upgrade of an SL-1 QCA23 cabinet (LE, N, NT, ST, 21, 21E or 51 Rls 15-17) to Meridian 1 Option 51C

Equipment required

Table 21-2 lists minimum hardware requirements needed to upgrade a QCA23 cabinet to a Meridian 1 Option 51C.

Table 21-2

Minimum hardware requirements for a Meridian 1 Option 51C

Quantity			
AC System	DC System	Part number	Description
	1	NT6D41AB	CE Power Supply DC
1	1	NT6D63AA	Input/Output Processor (IO) Pack
1	1	NT6D64AA	Core Multi-Drive Unit (CMDU)
1	1	NT6D65AA	Core Network Interface (CNI) Pack
1	1	NT6D66AA	Call Processor (CP) Pack
1	1	NT6D6003	Core Bus Terminator (CBT) Pack
1		NT7D00AA	Top Cap AC
	1	NT7D00BA Rls 2	Top Cap DC
	1	NT7D09CA	Pedestal DC
	1	NT7D10CA	System Monitor Panel Assembly
	1	NT7D67CA	Power Distribution Unit and filter assembly
1	1	NT8D17AA Rls 9	Conference/TDS Card
1	1	NT8D22AC	System Monitor
1		NT8D27AB Rls 3	Pedestal AC
1		NT8D29AA Rls 4	CE/PE power supply AC
1	1	NT8D41AA Rls 2	2 Port SDI Paddle Board
1	1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	1	NT8D46BH	System Monitor to MDF Cable
-continued-			

Table 21-2 (continued)

Minimum hardware requirements for a Meridian 1 Option 51C

Quantity			
AC System	DC System	Part number	Description
1		NT8D52AA	Pedestal Blower unit AC
	1	NT8D52DC	Pedestal Blower Unit DC
1		NT8D53AB Rls 5	Power Distribution Unit AC
1	1	NT8D84AA	SDI Paddle Board to I/O Cable
	1	NT8D85AZ	CMA to CMA, 5 ft (1520 mm)
1	1	NT8D80AZ	CMA to CMA, 5 ft (1520 mm)
1	1	NT8D93AJ	SDI Paddle Board I/O to DTE/DCE, 16 ft (4875 mm)
1	1	NT8D99AB	Network to Network Module Cable 2 ft (610 mm)
1	1	NT9D11DC	Core Network (CN) Module
1	1	QPC43R	Peripheral Signaling Card
	1	QPC84Q	Power Monitor
1	1	QPC441B Series D	3 Port Extender Card
1	1	QPC477-9A	Bus Terminating Units
1	1	QPC477-10B	Bus Terminating Units

Note: The vintages shown on circuit cards in Table 21-2 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA23 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 51C Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 51C to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 51C to the existing cabinet.
- A second NT8D86 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Note: The second NT8D86 cable is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as a QCA7 or 8) do not require the second NT8D86 cable since the NT8D73 cable can be connected directly to the Peripheral Buffer connector. For existing cabinets equipped to suppress EMI, refer to 553-3001-150, *Upgrade Engineering*.

Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

Upgrading consists of:

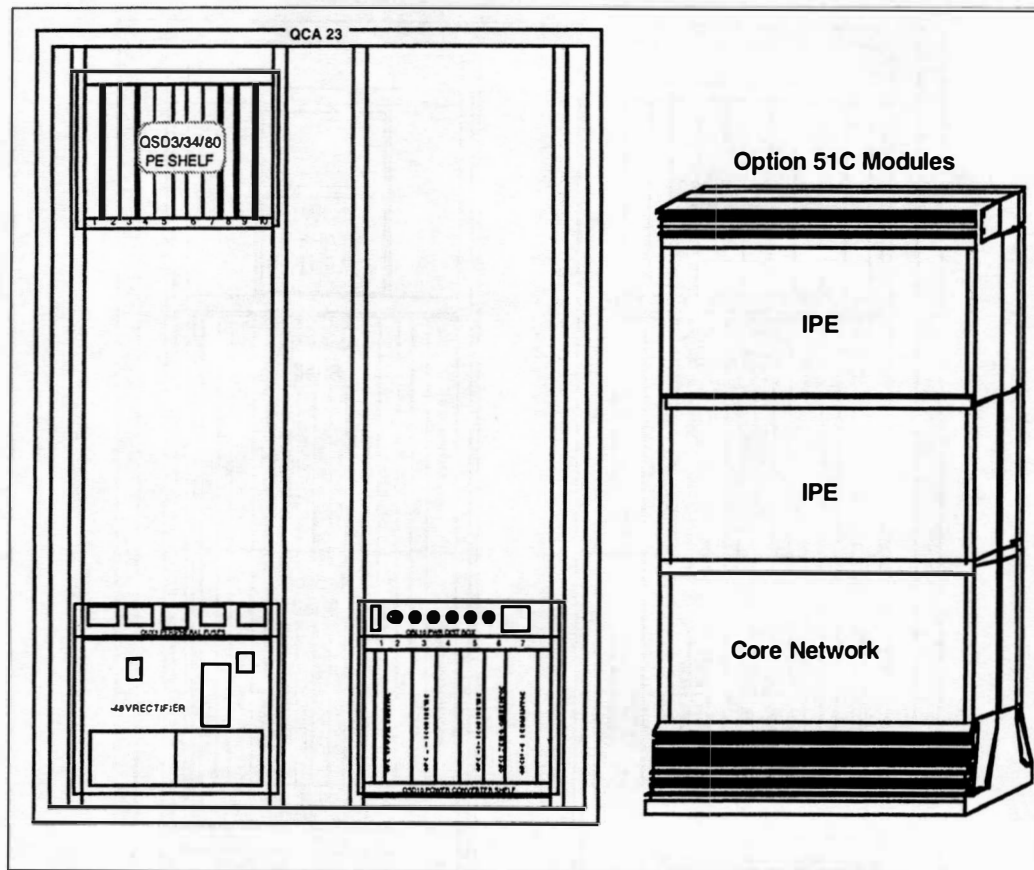
- installing the Meridian 1 Option 51C system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 21-1 shows a typical QCA23 cabinet and Figure 21-2 shows a QCA23 cabinet that has been upgraded to Meridian 1 Option 51C.

Figure 21-2

Typical QCA23 cabinet that has been upgraded to Meridian 1 Option 51C



Installing the Meridian 1 Option 51C system

The Option 51C equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, Core Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 51C equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 21-3 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.

- Install cabling:
 - Cable common equipment
 - Cable network loops (within the Option 51C columns only).

Note: Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.

 - Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 51C equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 21-3 shows Option 51C circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 21-3**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 21-3 (continued)**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 21-3 (continued)

NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves				Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."					
For each slave, indicates the slave address				Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."					
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master		on						
	slave		off						
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

Table 21-3 (continued)

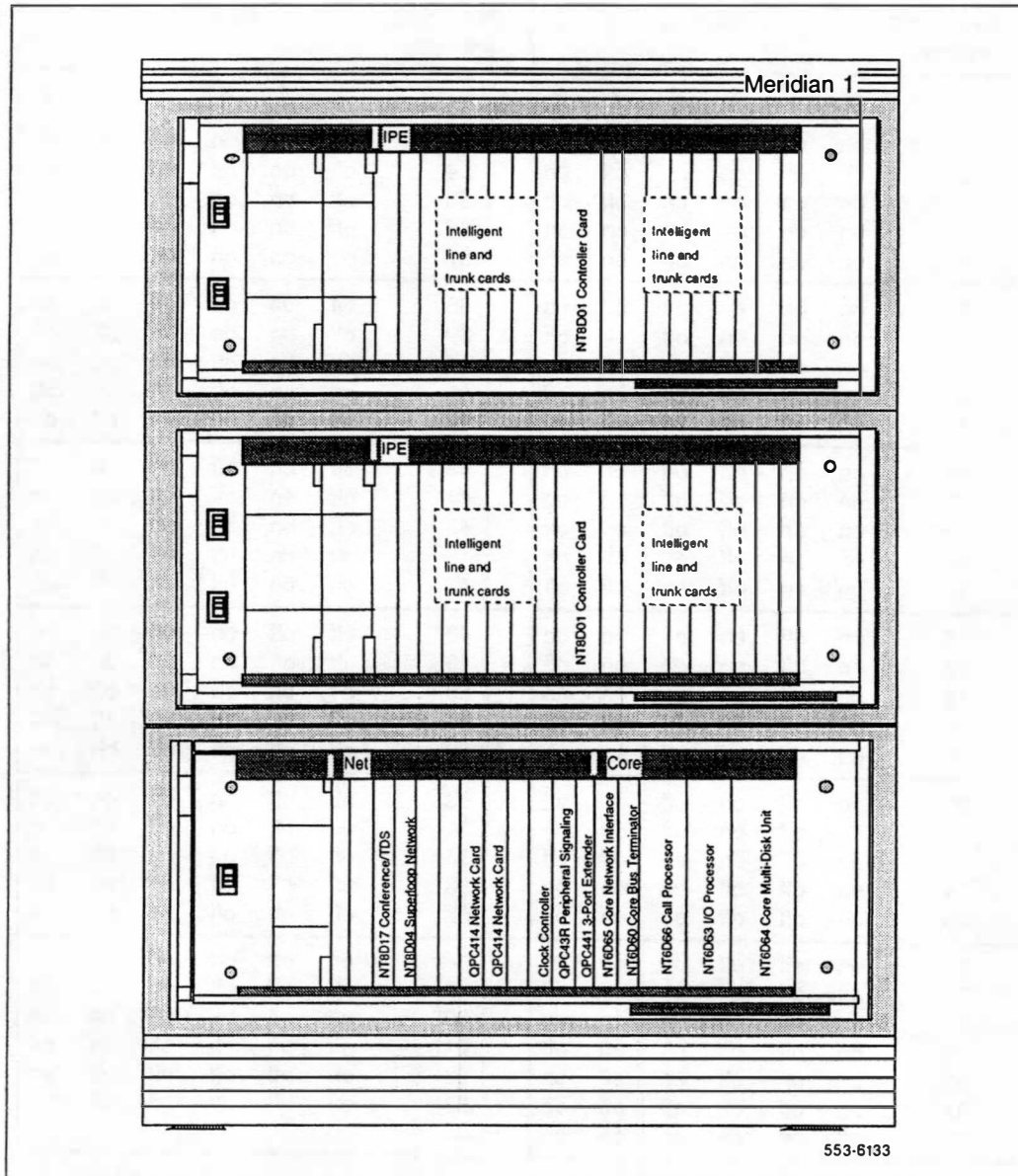
NT8D22 system monitor — settings for total number of slaves — SW2 on master

How many slave units		Switch position						How many slave units		Switch position					
		3	4	5	6	7	8			3	4	5	6	7	8
0		on	on	on	on	on	on	32		off	on	on	on	on	on
1		on	on	on	on	on	off	33		off	on	on	on	on	off
2		on	on	on	on	off	on	34		off	on	on	on	off	on
3		on	on	on	on	off	off	35		off	on	on	on	off	off
4		on	on	on	off	on	on	36		off	on	on	off	on	on
5		on	on	on	off	on	off	37		off	on	on	off	on	off
6		on	on	on	off	off	on	38		off	on	on	off	off	on
7		on	on	on	off	off	off	39		off	on	on	off	off	off
8		on	on	off	on	on	on	40		off	on	off	on	on	on
9		on	on	off	on	on	off	41		off	on	off	on	on	off
10		on	on	off	on	off	on	42		off	on	off	on	off	on
11		on	on	off	on	off	off	43		off	on	off	on	off	off
12		on	on	off	off	on	on	44		off	on	off	off	on	on
13		on	on	off	off	on	off	45		off	on	off	off	on	off
14		on	on	off	off	off	on	46		off	on	off	off	off	on
15		on	on	off	off	off	off	47		off	on	off	off	off	off
16		on	off	on	on	on	on	48		off	off	on	on	on	on
17		on	off	on	on	on	off	49		off	off	on	on	on	off
18		on	off	on	on	off	on	50		off	off	on	on	off	on
19		on	off	on	on	off	off	51		off	off	on	on	off	off
20		on	off	on	off	on	on	52		off	off	on	off	on	on
21		on	off	on	off	on	off	53		off	off	on	off	on	off
22		on	off	on	off	off	on	54		off	off	on	off	off	on
23		on	off	on	off	off	off	55		off	off	on	off	off	off
24		on	off	off	on	on	on	56		off	off	off	on	on	on
25		on	off	off	on	on	off	57		off	off	off	on	on	off
26		on	off	off	on	off	on	58		off	off	off	on	off	on
27		on	off	off	on	off	off	59		off	off	off	on	off	off
28		on	off	off	off	on	on	60		off	off	off	off	on	on
29		on	off	off	off	on	off	61		off	off	off	off	on	off
30		on	off	off	off	off	on	62		off	off	off	off	off	on
31		on	off	off	off	off	off	63		off	off	off	off	off	off
— continued —															

Table 21-3 (continued)
NT8D22 system monitor — slave address — SW2 on slave

Slave unit address							Position							Slave unit address							Position						
	3	4	5	6	7	8		3	4	5	6	7	8		3	4	5	6	7	8		3	4	5	6	7	8
1	on	on	on	on	on	off	33	off	on	on	on	on	off	33	off	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on	34	off	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off	35	off	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on	36	off	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off	37	off	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on	38	off	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off	39	off	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on	40	off	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off	41	off	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on	42	off	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off	43	off	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on	44	off	on	off	off	on	on	44	off	on	off	on	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off	45	off	on	off	off	on	off	45	off	on	off	on	off	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on	46	off	on	off	off	off	on	46	off	on	off	off	on	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off	47	off	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on	48	off	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off	49	off	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on	50	off	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off	51	off	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on	52	off	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off	53	off	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on	54	off	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off	55	off	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on	56	off	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off	57	off	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on	58	off	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off	59	off	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on	60	off	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off	61	off	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on	62	off	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off	63	off	off	off	off	off	off	63	off	off	off	off	off	off
32	off	on	on	on	on	on																					

Figure 21-3
Meridian 1 Option 51C Core Network and IPE modules



Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 51C: one designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 51C, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Note: Depending on the power configuration used it may be required to do modifications to the existing cabinets. If modifications are required, do them as part of the cut-over procedures (described later in this document) to avoid unnecessary interruption of service to the end users.

Connect the DC power to the Option 51C columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 51C equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 51C module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 51C modules.

- a new power source installed in conjunction with the Option 51C.

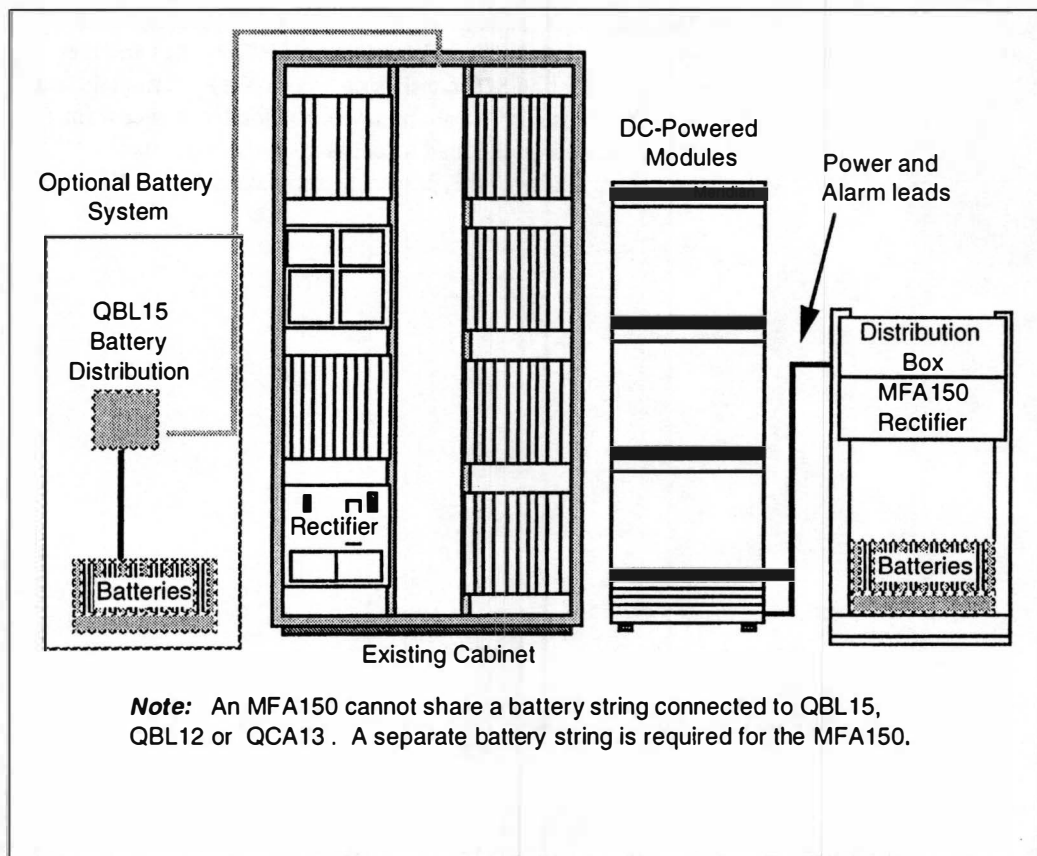
To determine the power requirements for the Option 51C system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 21-4 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 51C modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 51C column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 21-4

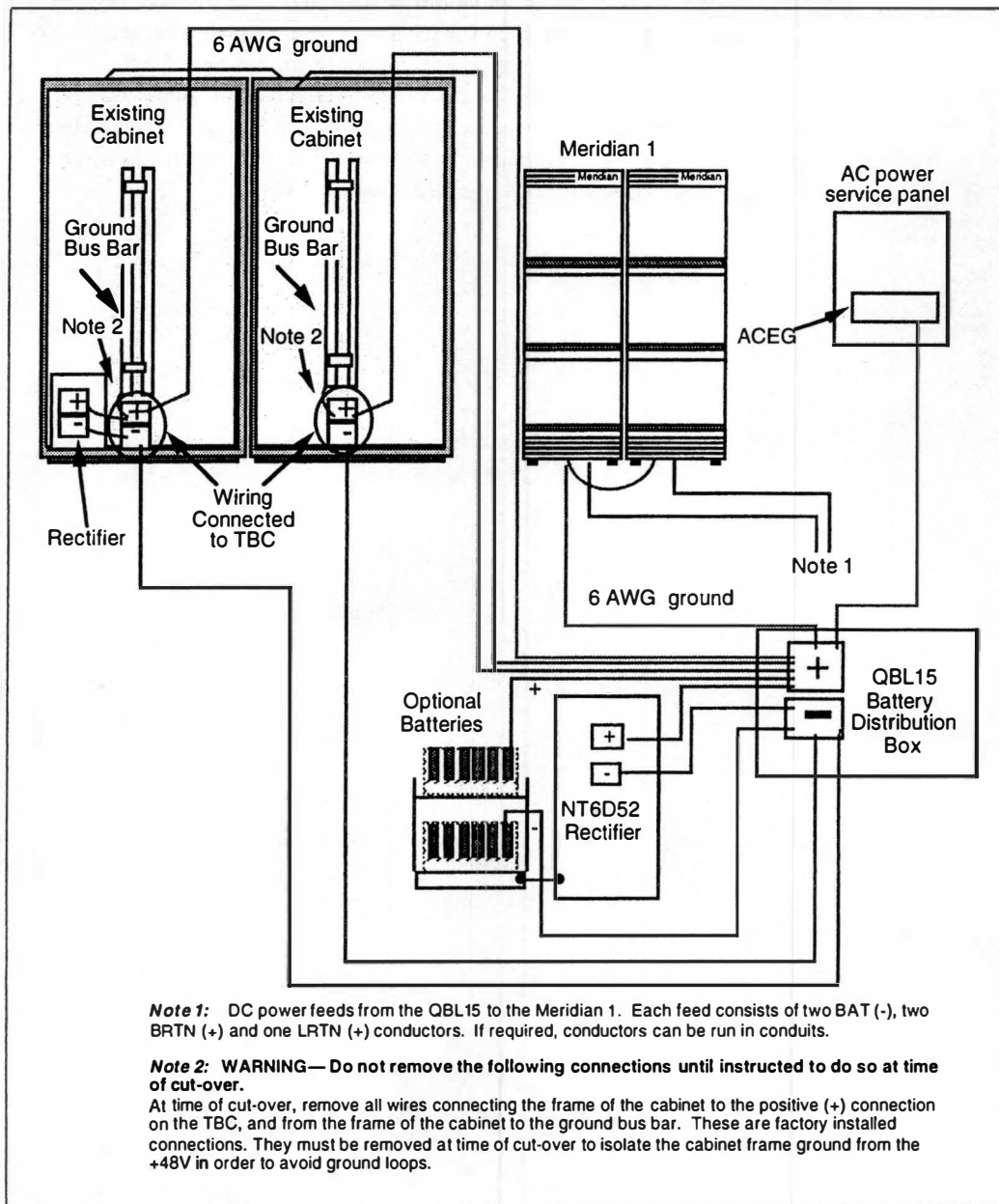
Typical arrangement of independently DC-powered Meridian 1 Option 51C modules



Common power source

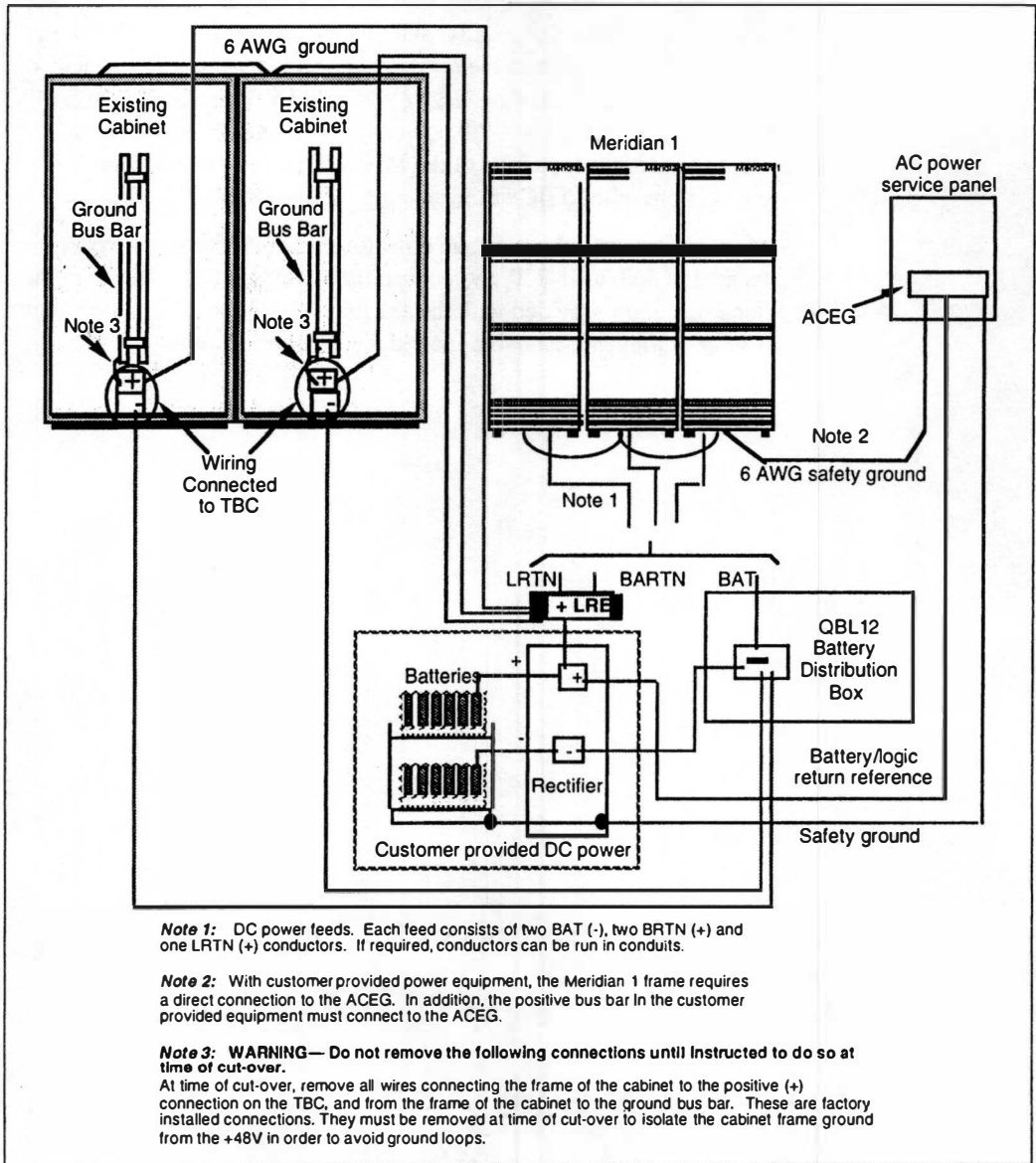
Existing cabinet rectifier as a common power source

- When the existing cabinet DC power source is used as a common power source for the cabinet and the column, any QSD4 rectifier will have to be replaced with a QRF8 rectifier and the existing battery distribution box will have to be replaced with a QBL15 battery distribution box. For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 21-5 illustrates a common power supply arrangement for the upgraded system. This includes both Option 51C modules and the existing cabinet. Option 51C consists of a Core Network module and an IPE module. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

Figure 21-5**Typical arrangement using a common DC power supply with optional battery backup**

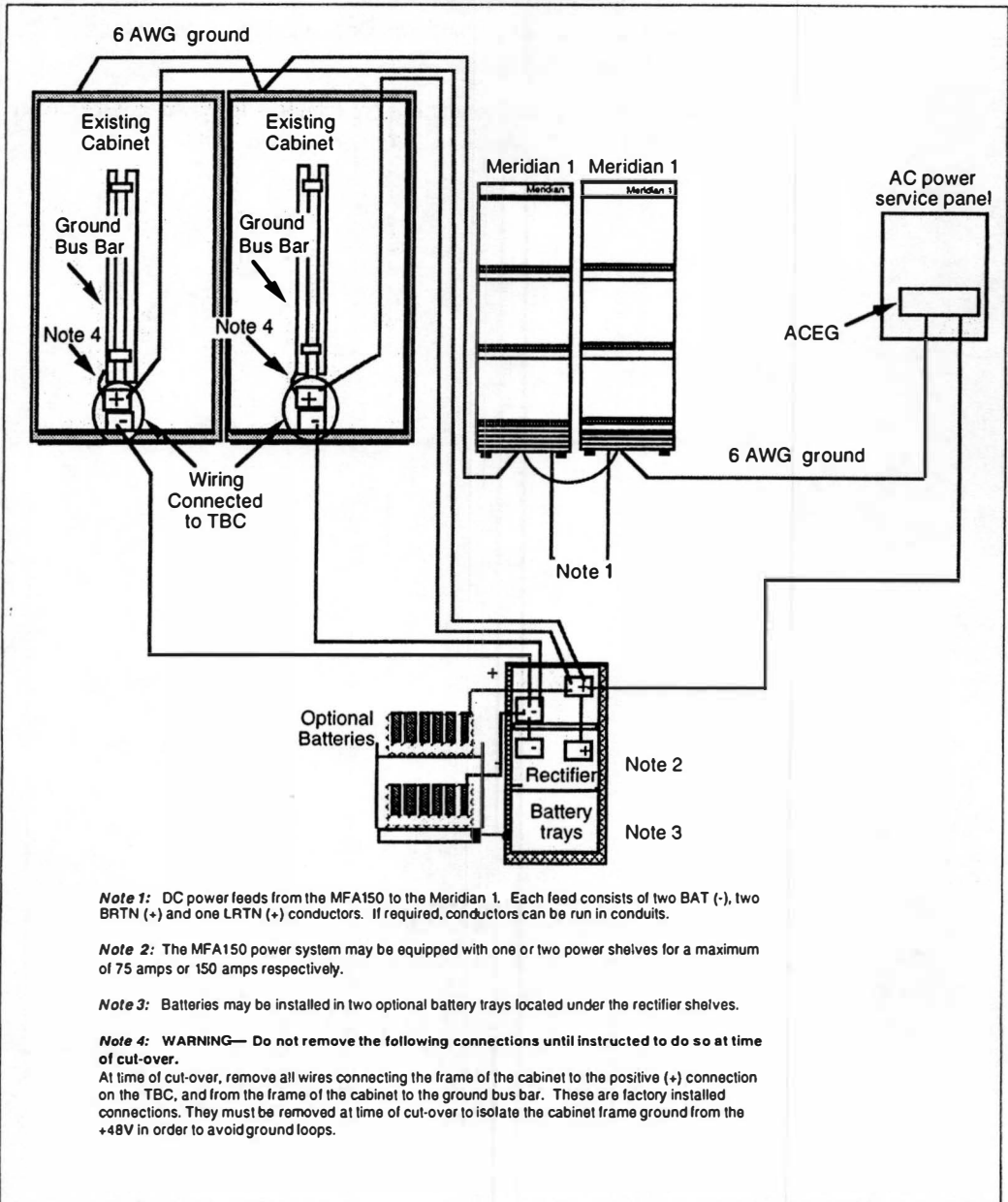
Customer provided power as a common power source

- A QBL12 Battery Distribution Box is normally used to connect to a customer provided DC power source. Figure 21-6 illustrates a customer provided common power supply arrangement for the upgraded system. This includes both Option 51C modules and the existing cabinet. A full description of QBL12 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 21-6**Typical arrangement using a customer provided common DC power supply**

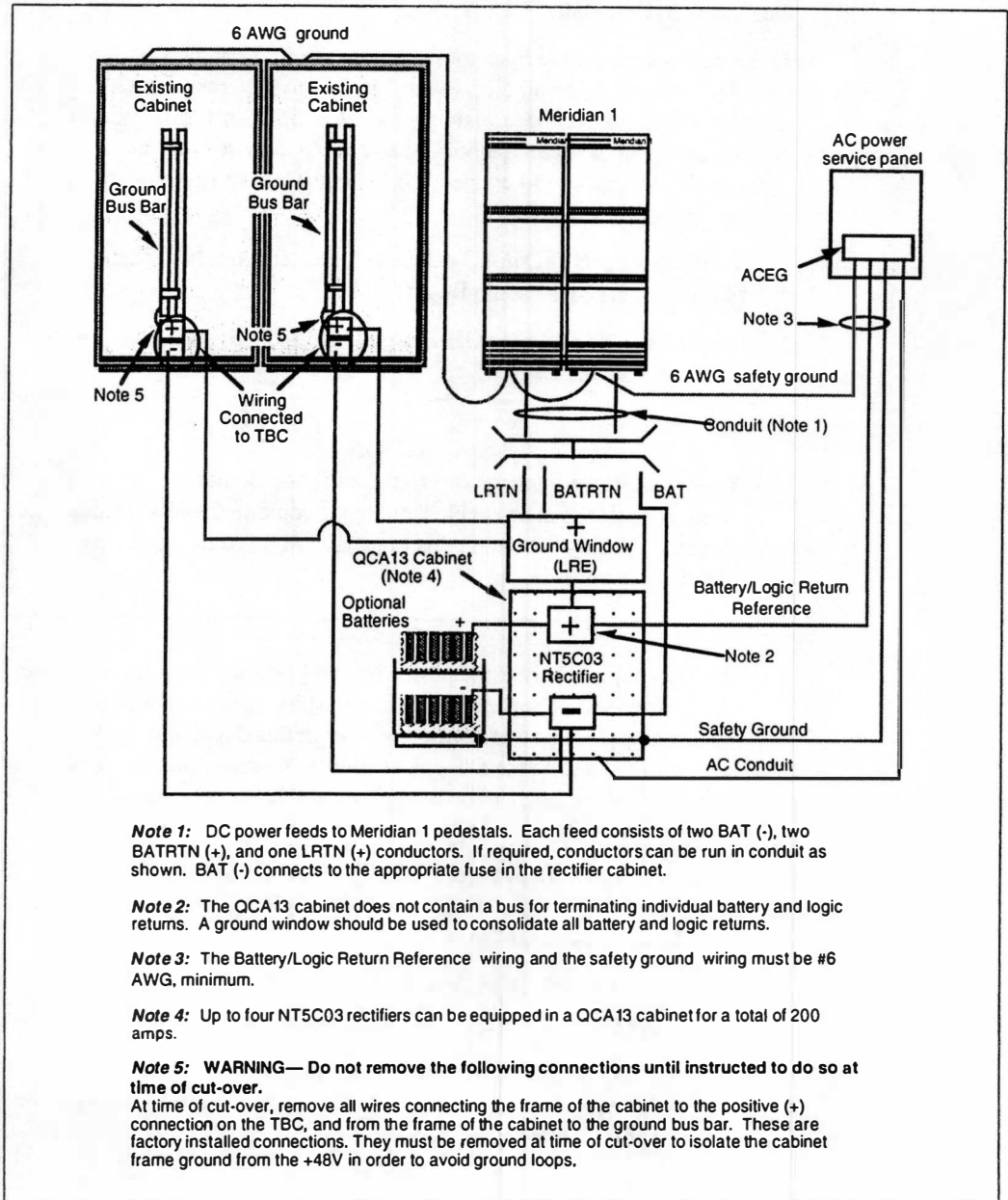
An MFA150 power system as a common power source

- An MFA150 power system assembly can be used as a common power source for both the Option 51C and the existing cabinets as shown in Figure 21-7. To connect the existing cabinets, disconnect the + and - 48V power leads from the existing power source, then reroute and connect them to the MFA150 power system. The connections are located under the top cover of the MFA150 power system. The connections at the TBC of the existing cabinet do not change.
- More information about connections for the MFA150 power system is located in 553-3001-210, *System installation procedures*. Refer to the documentation provided with the existing system for information about disconnecting and removing the old rectifier and batteries.

Figure 21-7**Typical arrangement using an MFA150 power system as a common power source**

An existing QCA13 power cabinet as a common power source

- A QCA13 power cabinet equipped with rectifiers can be used as a common power source for both the Option 21E and the existing cabinets as shown in Figure 1-8.
- For information about connections for the QCA13 power cabinet, refer to 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 21-8**Typical arrangement using a QCA13 as a common power source**

Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 51C modules.

These cables connect the System Monitor to the SDI Paddle Board in the Core Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section '**Separate power source**' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 21-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 51C system:

- 1 Power up and initially load the Option 51C column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.

- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
 - 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
 - 4 The Meridian 1 Option 51C is now operational.
-

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 51C column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 Connect an NT8D86 cable between the connector on the faceplate of the network card and the I/O panel of the Option 51C. One cable is required for each network loop.
- 2 Connect an NT8D73 shielded cable, up to 30 ft (9 m) in length, to the connector on the I/O panel of the Option 51C. Route the NT8D73 cable to the existing cabinet. Do not connect it to the Peripheral Buffer card in the existing cabinet at this time.

Note: Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

- 3 If required in the existing cabinet (see Note) connect an NT8D86 cable to the connector on the NT8D73 shielded cable from the Option 51C. Make sure that the connectors are locked together with the locking devices. Do not connect the cable to the faceplate of the Peripheral Buffer card at this time. It will be connected as part of the cutover procedure.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable.

Cutting-over

The following procedure describes how to cut-over to the Option 51C system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL12 or QCA13 unit**
Remove the fuses from the -48V fuse panel corresponding to each cabinet and column.
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.

Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.

 - **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
- 2 If required, perform power modifications to the existing cabinets.
- 3 In the existing cabinets, remove the wiring connecting the frame of the cabinet to the positive (+) connection of the TBC, and the wiring connecting the frame to the cabinet ground bus bar. Refer to Figures 21-5 through 21-7.

Note: This wiring was factory installed. It must be removed to avoid ground loops when existing cabinets are used with Meridian 1 modules.

- 4 This step applies only to Meridian 1 modules connected to a DC power source.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 2-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
 - the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.
- 5 This step applies only if a new common power source with battery backup connected to a QBL12 or QBL15 battery distribution box is to be used.

Note: This step does not apply if the common power source uses an MFA150 rectifier.

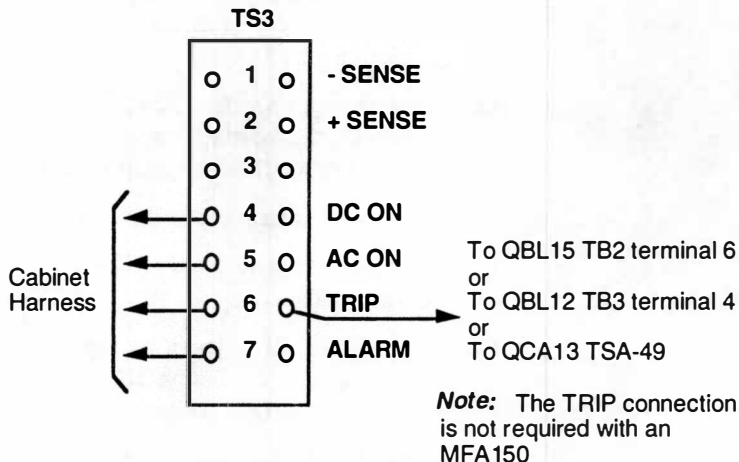
A TRIP lead must be connected to the TRIP connection on:

- the TRIP terminal on the terminal strip on the rectifier in existing cabinets equipped with a rectifier.
- the TRIP terminal of TS3 in existing cabinets not equipped with a rectifier.

The TRIP leads must be connected as follows.

If the existing rectifier is being removed from the cabinet, make the following wiring changes.

- a) If not already connected to TS3, tag and move the cabinet harness DC ON, AC ON, TRIP and ALARM leads presently connected on the rectifier to TS3 as shown in the above drawing. Depending on the type of existing cabinet, the TS3 is located either on the cabinet's TBC block, or on the QUT3 power unit.



- b) Install and connect a 16 AWG wire from terminal 6 (TRIP) on TS3 to the TRIP connection in the QBL12, QBL15 or QCA13 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connections in each cabinet with 16 AWG wire.
- c) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.

Note: The DC ON, AC ON and ALARM lead functions are performed by the Meridian 1 module. Leaving these leads connected in the existing cabinets only extends the alarm indicators to the QPC84 power monitors. If you wish, you may leave these leads disconnected. However, the TRIP lead must be connected.

If the existing rectifier is to remain in the cabinet, make the following wiring changes.

- a) Install and connect a 16 AWG wire from the TRIP connection on the terminal strip of the rectifier to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connection on the terminal strip of the rectifier in each cabinet with 16 AWG wire. In existing cabinets not equipped with a rectifier (such as a QCA7 cabinet powered by a QCA8 cabinet), 'daisy chain' to the TRIP connection on TS3.
 - b) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.
- 6 Cross-connect the alarm cables as shown in Figure 21-10.
 - 7 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.
 - 8 Connect the NT8D86 cables (if provided) or NT8D73 shielded network cables from the Option 51C to the connector on the faceplate of the Peripheral Buffer circuit card in the existing cabinets.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable. The NT8D73 shielded cable can be connected directly to the connector of the Peripheral Buffer card.

—OR—

If the existing cabinet is equipped to suppress EMI, the NT8D73 shielded cable should be connected to its assigned filter connector. See 553-3001-150, *Upgrade Engineering* for more information.

- 9 Remove the QPC84 Power Monitor from the QCA23 cabinet and set switch C11, position 2 to ON. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required. Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.

Note: Disregard any remaining alarm indications. Alarm indications should return to normal once the upgrade is completed and equipment that is no longer required has been removed as described later in this chapter.

- 10 Restore power to the cabinets and column by reinserting the removed fuse and resetting all circuit breakers to ON.

CAUTION

Do not remove the NT8D22 system monitor (XSM) from the column while the system is in service. Removing the XSM may cause the input circuit breakers on the existing cabinets to trip.

- 11 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.
-

Figure 21-9
NT8D46 cable types

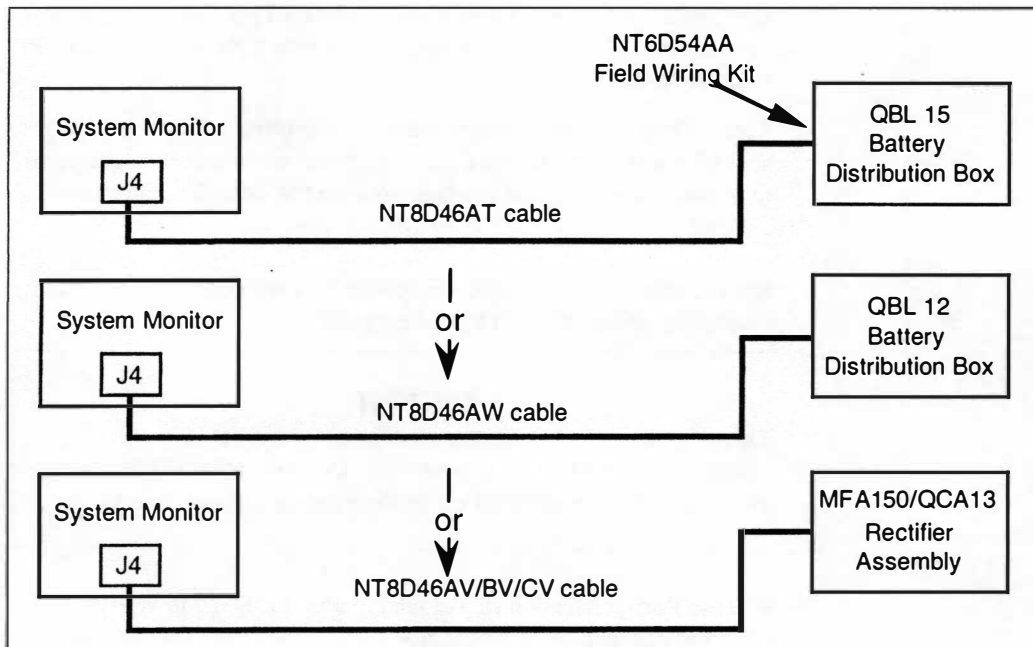
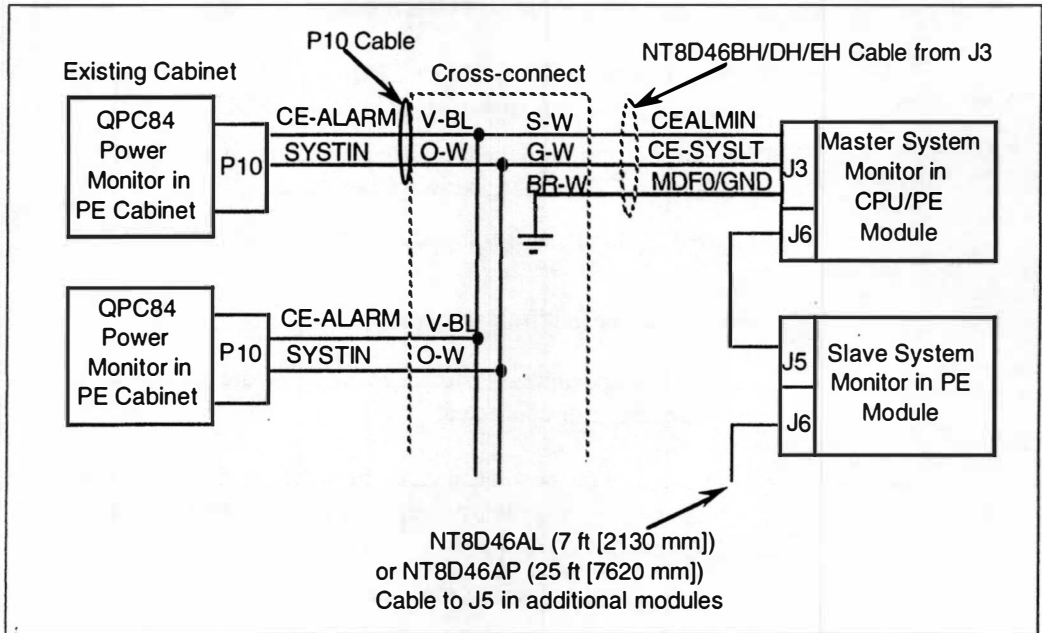


Figure 21-10
Connecting alarm cables between a cabinet and a column



Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

Removing equipment no longer required

The following procedure describes how to remove the equipment that is no longer required once the Option 51C is operating normally.

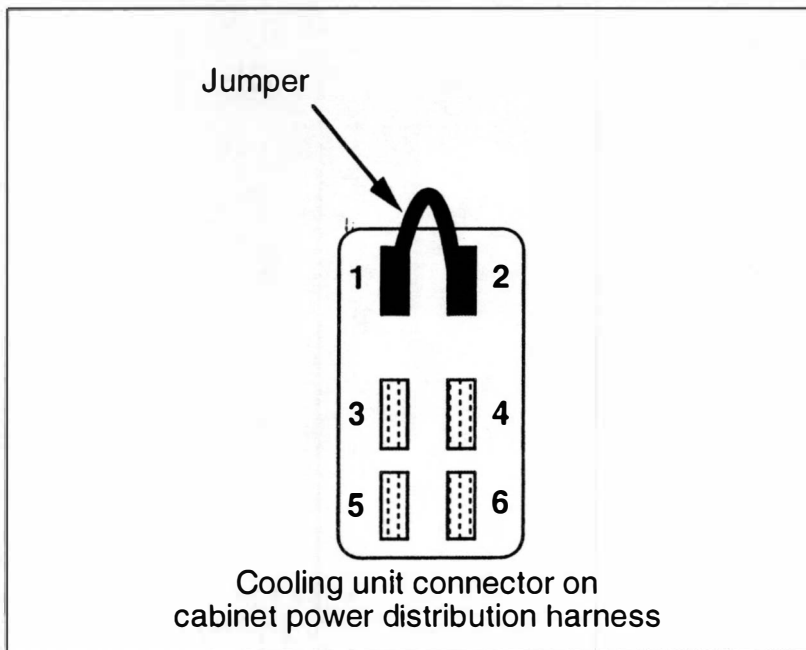
- 1 Set circuit breakers CPU0, NET0, CPU1 and NET1 on the QBL10 power distribution box in the QCA23 cabinet to OFF.
- 2 Disconnect cables from the faceplate connectors on circuit cards located in the CPU/MEM and Network shelves.
- 3 Remove CE circuit cards from the CE shelf and store them in a safe place.
- 4 Remove the tape unit from the cabinet.

Note: The tape unit must first be removed before the tape unit connector can be disconnected.

- Disconnect the power connector from the cabinet power wiring harness to the shelf housing the tape unit or QMM38 Mass Storage Unit, if equipped.
- 5 If you are using the main CE shelf for DTI/PRI cards:
 - Install the DTI/PRI cards in CE shelves.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the Core Network module of the Option 21E upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breakers CPU0, NET0, CPU1 and NET1 on the QBL10 power distribution box to ON.

- 6 If you are not going to use the CE shelf for DTI/PRI cards:
- Disconnect alarm connectors from the CE shelves.
 - Unplug all power converter cards the shelves.
 - Disconnect power connections and the power monitor connector from the cabinet power distribution harness to the backplane on QSD54 and QSD55 shelves.
 - Disconnect and remove the QUD4 and QUD6 cooling units. Place a jumper (a piece of 24 or 26 AWG bare wire or a paper clip can be used) across power monitor leads 1 and 2 of the cooling unit power connector as shown in Figure 21-11. This disables the alarm for the removed cooling unit.

Figure 21-11
Cooling unit alarm connection



SL-1 QCA28 cabinet upgrade to Meridian 1 Option 51C

This procedure is used to upgrade an SL-1 QCA28 cabinet (A, ST, 21 or 21E) to Meridian 1 Option 51C. To upgrade to a Meridian 1 Option 51C system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51C:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51C operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 51C is operating with the new software provided with it.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51C operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Modular upgrade of an SL-1 QCA28 cabinet (A, ST, 21 or 21E) to Meridian 1 Option 51C

Equipment required

Table 22-1 lists minimum hardware requirements needed to upgrade to a DC powered Meridian 1 Option 51C system.

Table 22-1

Minimum hardware requirements for a Meridian 1 Option 51C

Quantity			
AC System	DC System	Part number	Description
	1	NT6D41AB	CE Power Supply DC
1	1	NT6D63AA	Input/Output Processor (IO) Pack
1	1	NT6D64AA	Core Multi-Drive Unit (CMDU)
1	1	NT6D65AA	Core Network Interface (CNI) Pack
1	1	NT6D66AA	Call Processor (CP) Pack
1	1	NT6D6003	Core Bus Terminator (CBT) Pack
1		NT7D00AA	Top Cap AC
	1	NT7D00BA Rls 2	Top Cap DC
	1	NT7D09CA	Pedestal DC
	1	NT7D10CA	System Monitor Panel Assembly
	1	NT7D67CA	Power Distribution Unit and filter assembly
1	1	NT8D17AA Rls 9	Conference/TDS Card
1	1	NT8D22AC	System Monitor
1		NT8D27AB Rls 3	Pedestal AC
1		NT8D29AA Rls 4	CE/PE power supply AC
1	1	NT8D41AA Rls 2	2 Port SDI Paddle Board
1	1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	1	NT8D46BH	System Monitor to MDF Cable
-continued-			

Table 22-1 (continued)

Minimum hardware requirements for a Meridian 1 Option 51C

Quantity			
AC System	DC System	Part number	Description
1		NT8D52AA	Pedestal Blower unit AC
	1	NT8D52DC	Pedestal Blower Unit DC
1		NT8D53AB Rls 5	Power Distribution Unit AC
1	1	NT8D84AA	SDI Paddle Board to I/O Cable
	1	NT8D85AZ	CMA to CMA, 5 ft (1520 mm)
1	1	NT8D80AZ	CMA to CMA, 5 ft (1520 mm)
1	1	NT8D93AJ	SDI Paddle Board I/O to DTE/DCE, 16 ft (4875 mm)
1	1	NT8D99AB	Network to Network Module Cable 2 ft (610 mm)
1	1	NT9D11DC	Core Network (CN) Module
1	1	QPC43R	Peripheral Signaling Card
	1	QPC84Q	Power Monitor
1	1	QPC441B Series D	3 Port Extender Card
1	1	QPC477-9A	Bus Terminating Units
1	1	QPC477-10B	Bus Terminating Units

Note: The vintages shown on circuit cards in Table 22-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA28 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 51C Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 51C to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 51C to the existing cabinet.
- A second NT8D86 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Note: The second NT8D86 cable is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as a QCA7 or 8) do not require the second NT8D86 cable since the NT8D73 cable can be connected directly to the Peripheral Buffer connector. For existing cabinets equipped to suppress EMI, refer to 553-3001-150, *Upgrade Engineering*.

Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

To upgrade to a Meridian 1 Option 51C system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 51C system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 22-1 shows a typical QCA28 cabinet and Figure 22-2 shows a QCA28 cabinet that has been upgraded to Meridian 1 Option 51C.

Figure 22-1
Typical QCA28 cabinet

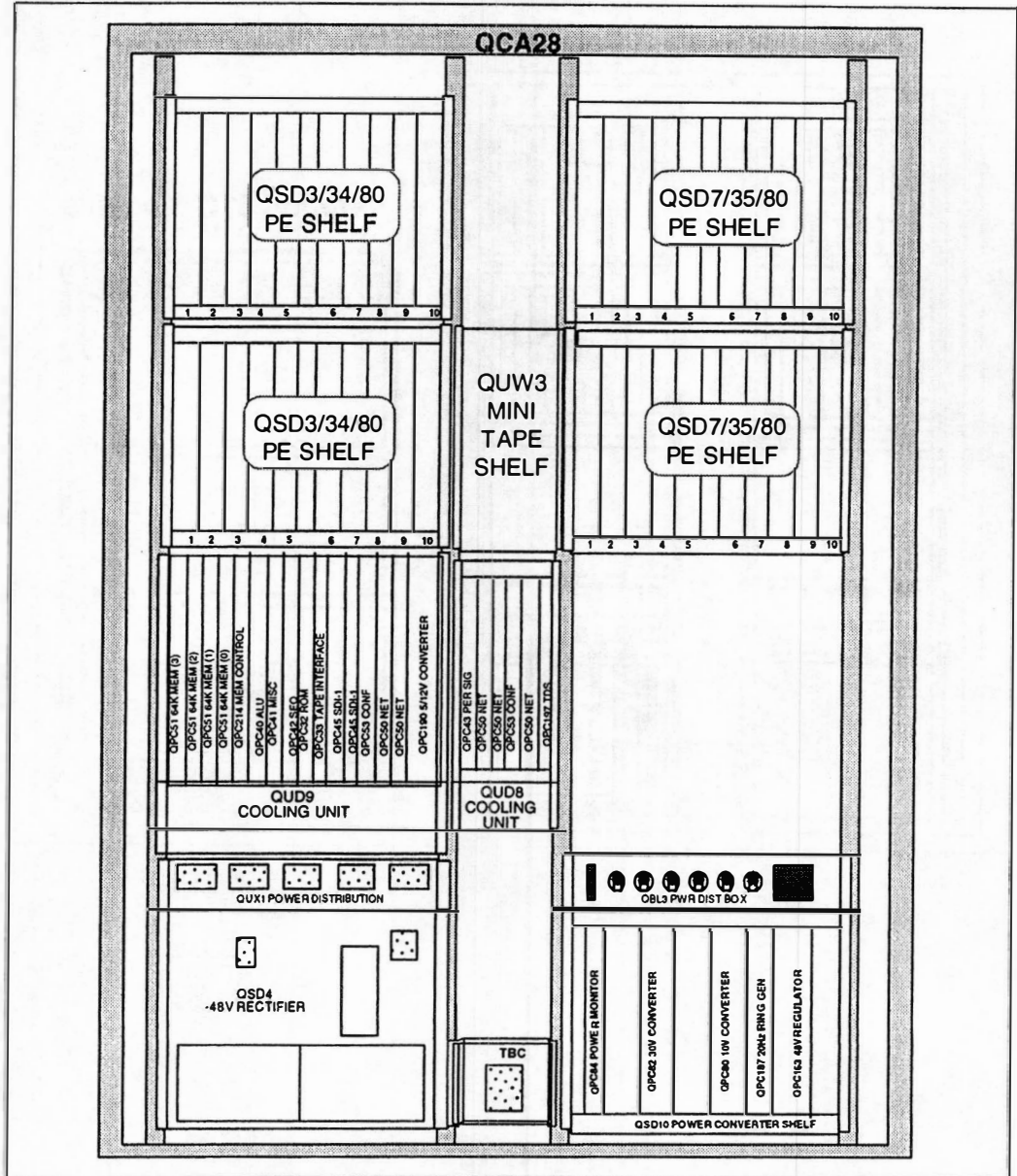
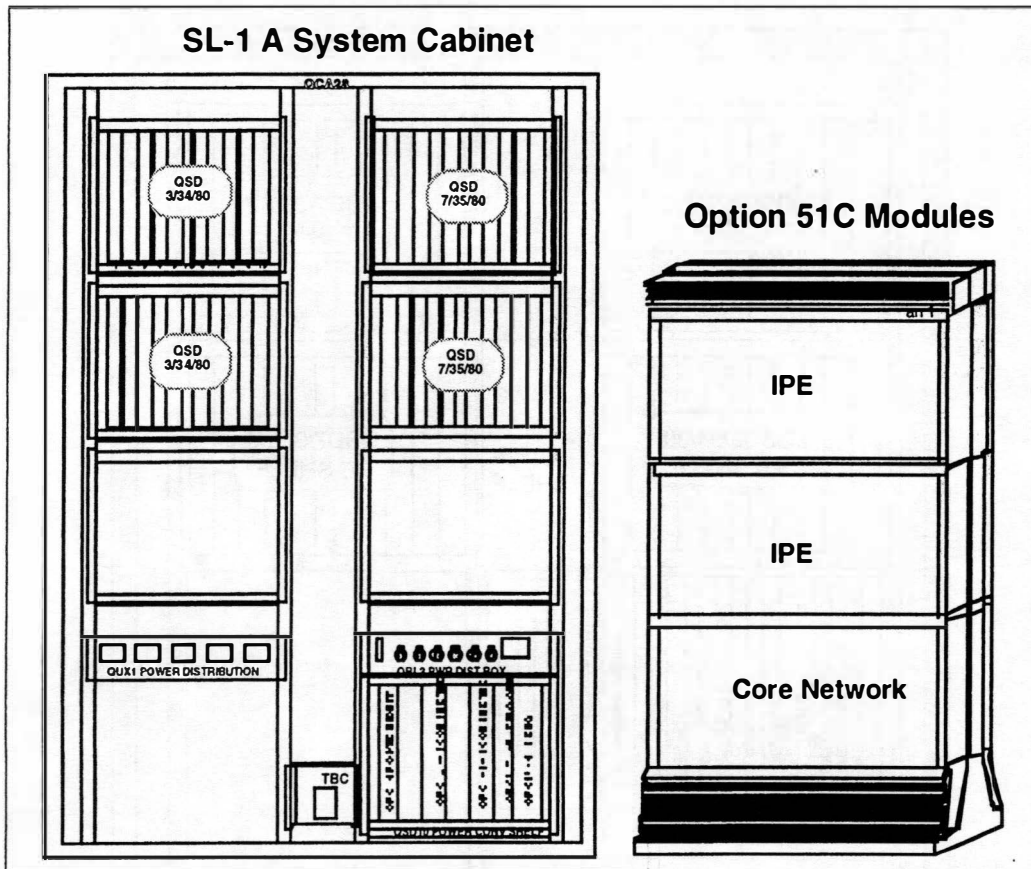


Figure 22-2

Typical QCA28 cabinet that has been upgraded to Meridian 1 Option 51C



Installing the Meridian 1 Option 51C system

The Option 51C equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, Core Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 51C equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 22-2 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.
- Install cabling:

- Cable common equipment
- Cable network loops (within the Option 51C columns only).

Note: Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.

- Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 51C equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 22-3 shows Option 51C circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 22-2

NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 22-2 (continued)

NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 22-2 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves		Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."							
For each slave, indicates the slave address		Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."							
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master		on						
	slave		off						
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

Table 22-2 (continued)

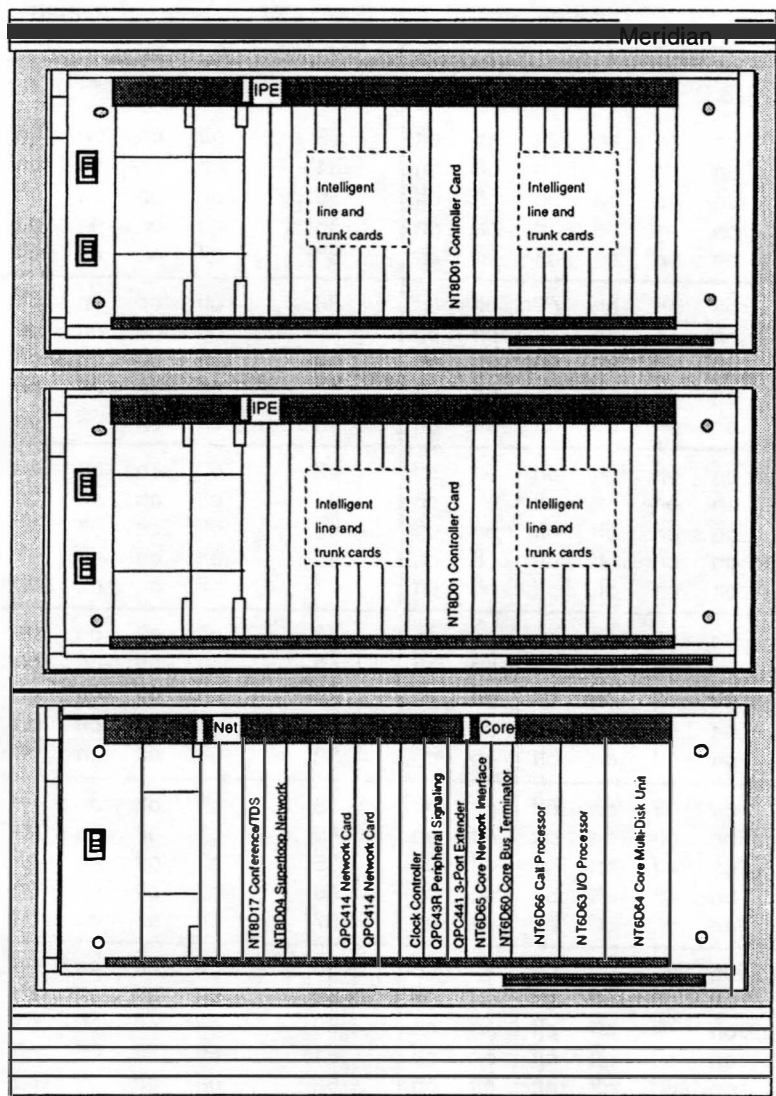
NT8D22 system monitor — settings for total number of slaves — SW2 on master

How many slave units		Switch position						How many slave units		Switch position					
		3	4	5	6	7	8			3	4	5	6	7	8
0		on	on	on	on	on	on	32		off	on	on	on	on	on
1		on	on	on	on	on	off	33		off	on	on	on	on	off
2		on	on	on	on	off	on	34		off	on	on	on	off	on
3		on	on	on	on	off	off	35		off	on	on	on	off	off
4		on	on	on	off	on	on	36		off	on	on	off	on	on
5		on	on	on	off	on	off	37		off	on	on	off	on	off
6		on	on	on	off	off	on	38		off	on	on	off	off	on
7		on	on	on	off	off	off	39		off	on	on	off	off	off
8		on	on	off	on	on	on	40		off	on	off	on	on	on
9		on	on	off	on	on	off	41		off	on	off	on	on	off
10		on	on	off	on	off	on	42		off	on	off	on	off	on
11		on	on	off	on	off	off	43		off	on	off	on	off	off
12		on	on	off	off	on	on	44		off	on	off	off	on	on
13		on	on	off	off	on	off	45		off	on	off	off	on	off
14		on	on	off	off	off	on	46		off	on	off	off	off	on
15		on	on	off	off	off	off	47		off	on	off	off	off	off
16		on	off	on	on	on	on	48		off	off	on	on	on	on
17		on	off	on	on	on	off	49		off	off	on	on	on	off
18		on	off	on	on	off	on	50		off	off	on	on	off	on
19		on	off	on	on	off	off	51		off	off	on	on	off	off
20		on	off	on	off	on	on	52		off	off	on	off	on	on
21		on	off	on	off	on	off	53		off	off	on	off	on	off
22		on	off	on	off	off	on	54		off	off	on	off	off	on
23		on	off	on	off	off	off	55		off	off	on	off	off	off
24		on	off	off	on	on	on	56		off	off	off	on	on	on
25		on	off	off	on	on	off	57		off	off	off	on	on	off
26		on	off	off	on	off	on	58		off	off	off	on	off	on
27		on	off	off	on	off	off	59		off	off	off	on	off	off
28		on	off	off	off	on	on	60		off	off	off	off	on	on
29		on	off	off	off	on	off	61		off	off	off	off	on	off
30		on	off	off	off	off	on	62		off	off	off	off	off	on
31		on	off	off	off	off	off	63		off	off	off	off	off	off
— continued —															

Table 22-2 (continued)
NT8D22 system monitor — slave address — SW2 on slave

Slave unit address							Position							Slave unit address							Position						
							3	4	5	6	7	8								3	4	5	6	7	8		
1	on	on	on	on	on	off	33	off	on	on	on	on	on	off	33	off	on	on	on	on	off	on					
2	on	on	on	on	off	on	34	off	on	on	on	on	off	on	34	off	on	on	on	off	on						
3	on	on	on	on	off	off	35	off	on	on	on	on	off	off	35	off	on	on	on	off	off						
4	on	on	on	off	on	on	36	off	on	on	off	on	on	on	36	off	on	on	off	on	on						
5	on	on	on	off	on	off	37	off	on	on	off	on	off	on	37	off	on	on	off	on	off						
6	on	on	on	off	off	on	38	off	on	on	off	off	on	on	38	off	on	on	off	off	on						
7	on	on	on	off	off	off	39	off	on	on	off	off	off	off	39	off	on	on	off	off	off						
8	on	on	off	on	on	on	40	off	on	off	on	on	on	on	40	off	on	off	on	on	on						
9	on	on	off	on	on	off	41	off	on	off	on	on	off	off	41	off	on	off	on	on	off						
10	on	on	off	on	off	on	42	off	on	off	on	off	on	on	42	off	on	off	on	off	on						
11	on	on	off	on	off	off	43	off	on	off	on	off	off	off	43	off	on	off	on	off	off						
12	on	on	off	off	on	on	44	off	on	off	off	off	on	on	44	off	on	off	off	on	on						
13	on	on	off	off	on	off	45	off	on	off	off	off	on	off	45	off	on	off	off	on	off						
14	on	on	off	off	off	on	46	off	on	off	off	off	off	on	46	off	on	off	off	off	on						
15	on	on	off	off	off	off	47	off	on	off	off	off	off	off	47	off	on	off	off	off	off						
16	on	off	on	on	on	on	48	off	off	on	on	on	on	on	48	off	off	on	on	on	on						
17	on	off	on	on	on	off	49	off	off	on	on	on	on	off	49	off	off	on	on	on	off						
18	on	off	on	on	off	on	50	off	off	on	on	off	on	on	50	off	off	on	on	off	on						
19	on	off	on	on	off	off	51	off	off	on	on	off	off	off	51	off	off	on	on	off	off						
20	on	off	on	off	on	on	52	off	off	on	off	on	on	on	52	off	off	on	off	on	on						
21	on	off	on	off	on	off	53	off	off	on	off	on	off	off	53	off	off	on	off	on	off						
22	on	off	on	off	off	on	54	off	off	on	off	off	on	on	54	off	off	on	off	off	on						
23	on	off	on	off	off	off	55	off	off	on	off	off	off	off	55	off	off	on	off	off	off						
24	on	off	off	on	on	on	56	off	off	off	on	on	on	on	56	off	off	off	on	on	on						
25	on	off	off	on	on	off	57	off	off	off	on	on	off	off	57	off	off	off	on	on	off						
26	on	off	off	on	off	on	58	off	off	off	on	off	on	on	58	off	off	off	on	off	on						
27	on	off	off	on	off	off	59	off	off	off	on	off	off	off	59	off	off	off	on	off	off						
28	on	off	off	off	on	on	60	off	off	off	off	on	on	on	60	off	off	off	off	on	on						
29	on	off	off	off	on	off	61	off	off	off	off	on	on	off	61	off	off	off	off	on	off						
30	on	off	off	off	off	on	62	off	off	off	off	off	off	on	62	off	off	off	off	off	on						
31	on	off	off	off	off	off	63	off	off	off	off	off	off	off	63	off	off	off	off	off	off						
32	off	on	on	on	on	on																					

Figure 22-3
Meridian 1 Option 51C Core Network and IPE modules



553-6133

Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 51C: one designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 51C, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Note: Depending on the power configuration used it may be required to do modifications to the existing cabinets. If modifications are required, do them as part of the cut-over procedures (described later in this document) to avoid unnecessary interruption of service to the end users.

Connect the DC power to the Option 51C columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 51C equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 51C module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 51C modules.

- a new power source installed in conjunction with the Option 51C.

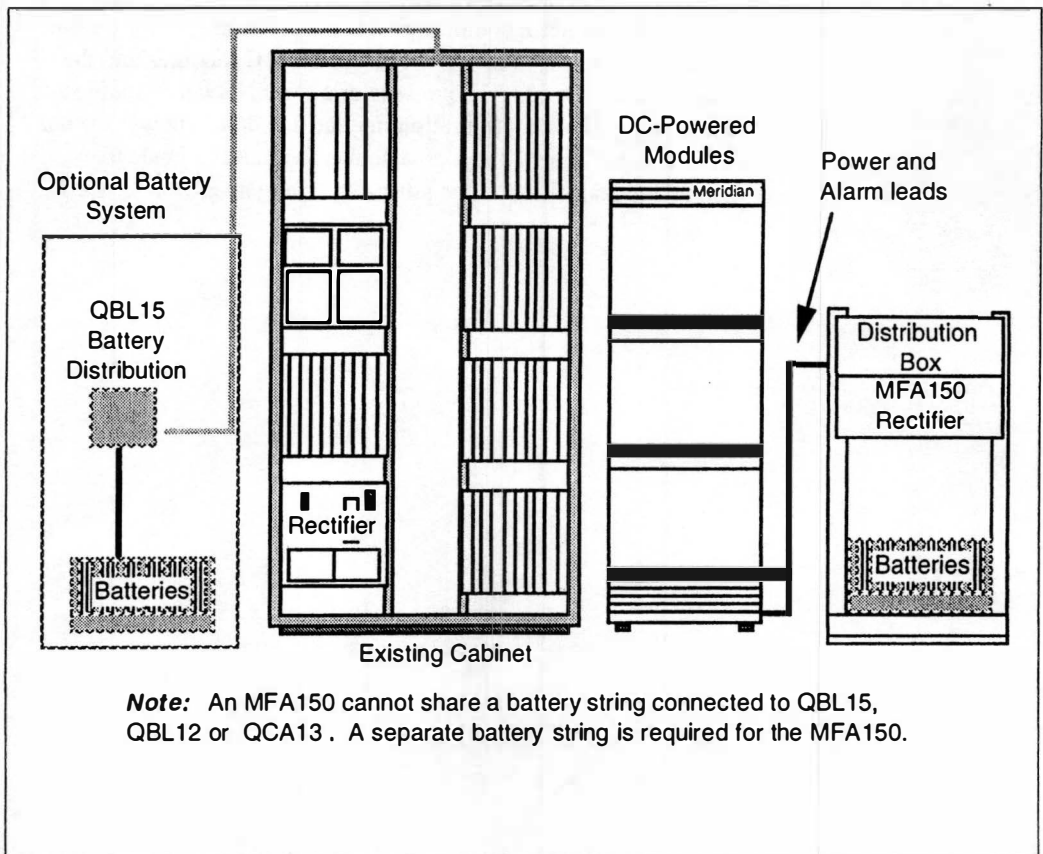
To determine the power requirements for the Option 51C system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 22-4 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 51C modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 51C column is contained in 553-3001-210, *System installation procedures*.

Figure 22-4

Typical arrangement of independently DC-powered Meridian 1 Option 51C modules



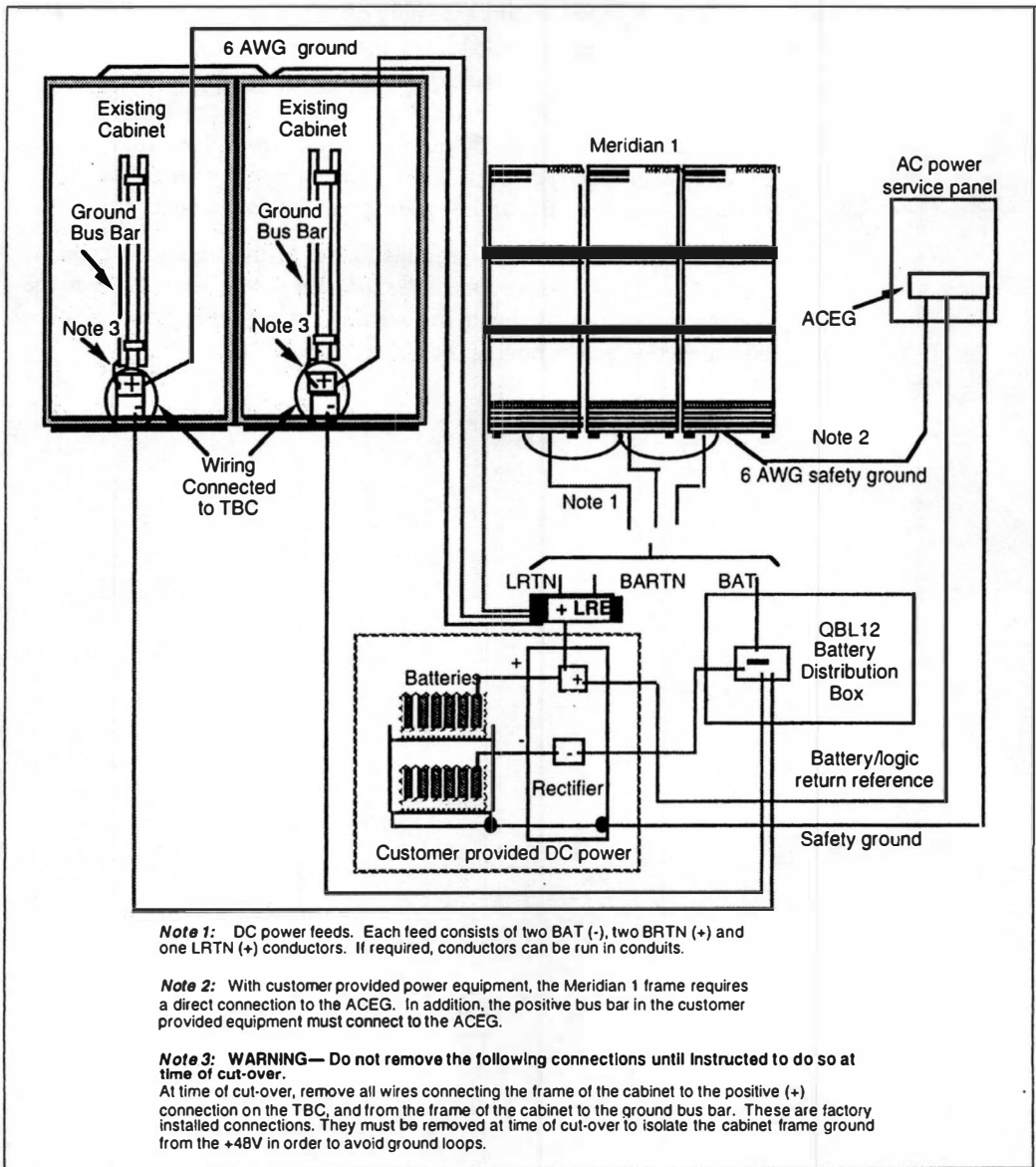
Common power source

Existing cabinet rectifier as a common power source

- When the existing cabinet DC power source is used as a common power source for the cabinet and the column, any QSD4 rectifier will have to be replaced with a QRF8 rectifier and the existing battery distribution box will have to be replaced with a QBL15 battery distribution box. For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 22-5 illustrates a common power supply arrangement for the upgraded system. This includes both Option 51C modules and the existing cabinet. Option 51C consists of a Core Network module and an IPE module. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

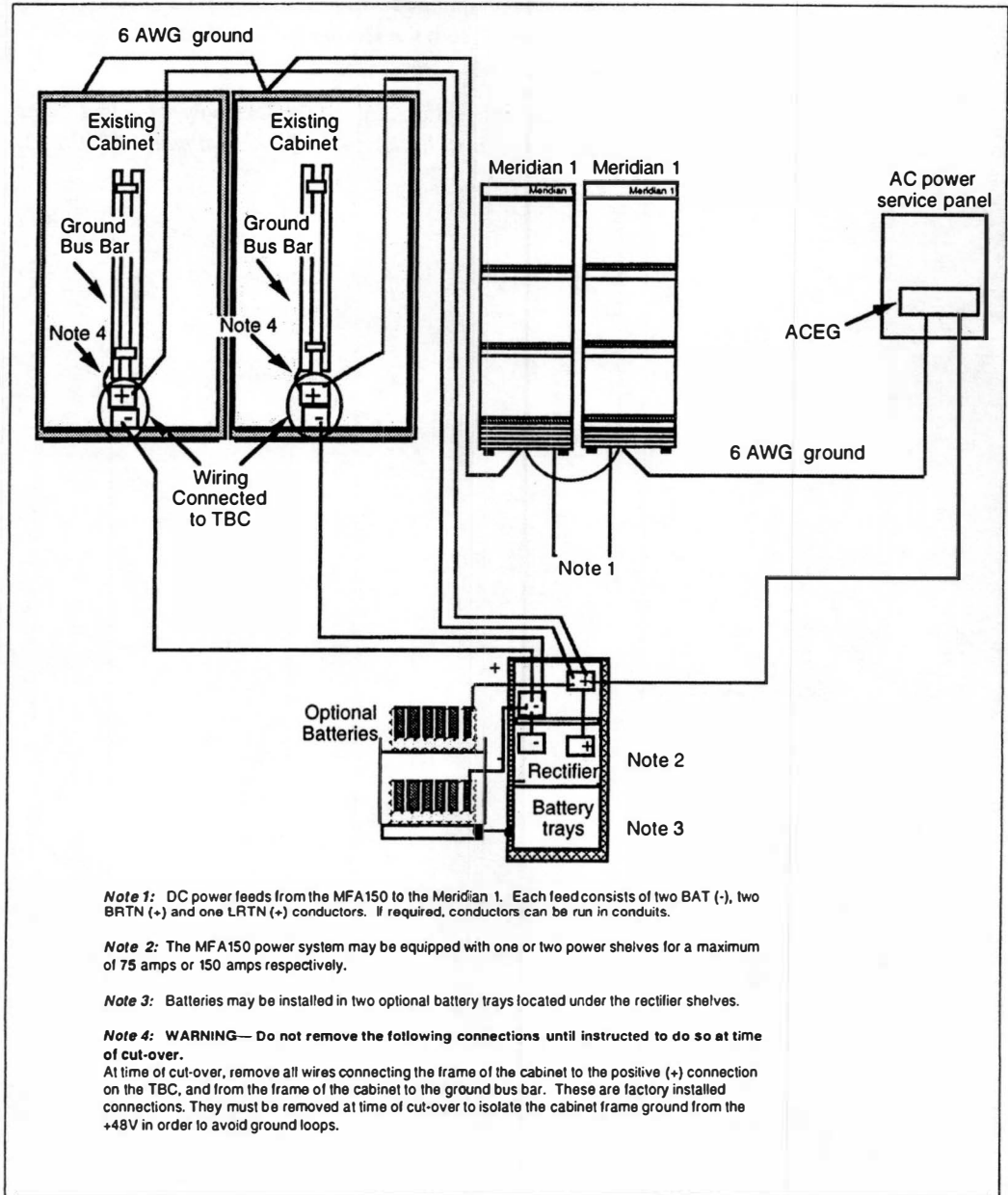
Customer provided power as a common power source

- A QBL12 Battery Distribution Box is normally used to connect to a customer provided DC power source. Figure 22-6 illustrates a customer provided common power supply arrangement for the upgraded system. This includes both Option 51C modules and the existing cabinet. A full description of QBL12 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 22-6**Typical arrangement using a customer provided common DC power supply**

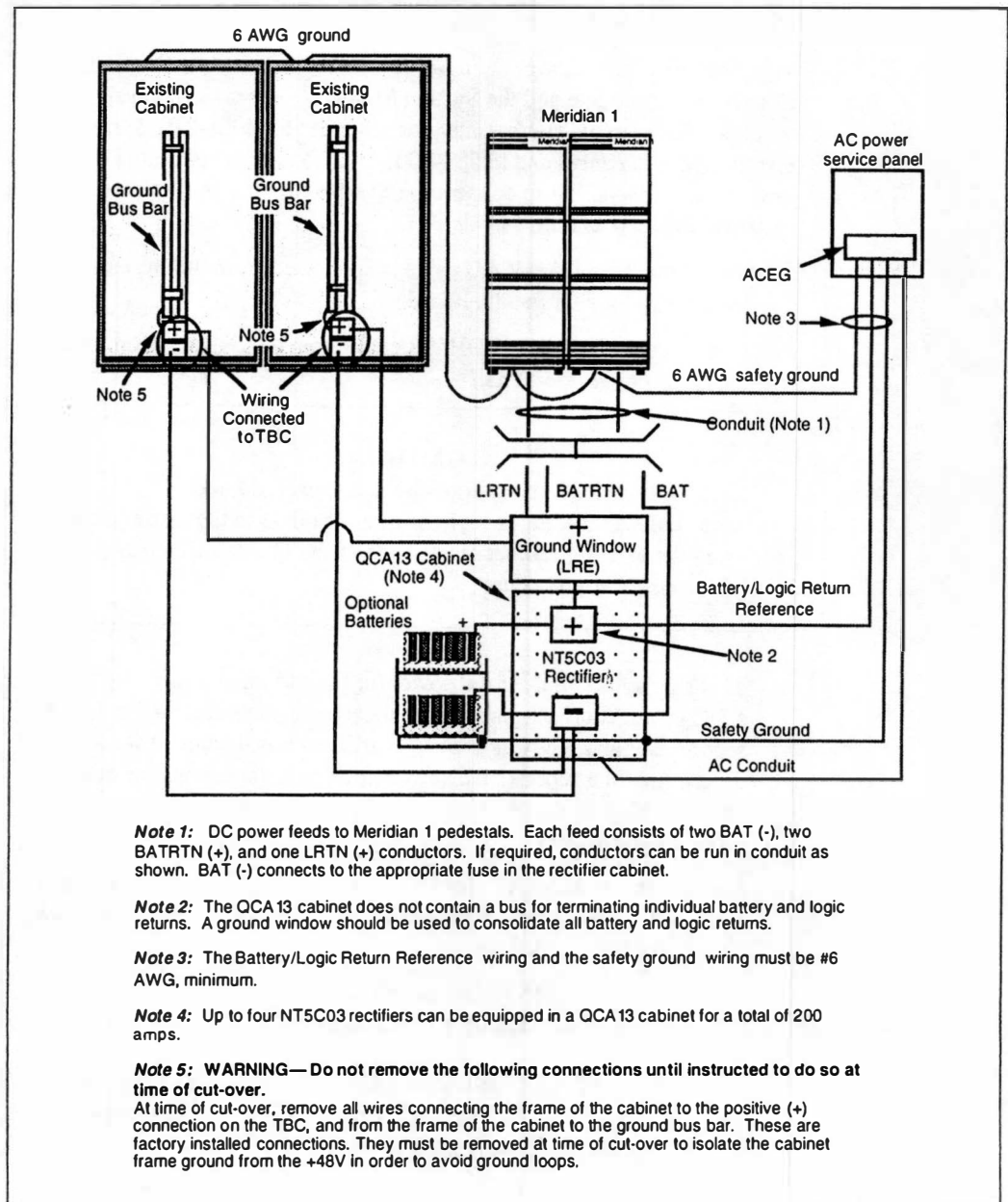
An MFA150 power system as a common power source

- An MFA150 power system assembly can be used as a common power source for both the Option 51C and the existing cabinets as shown in Figure 22-7. To connect the existing cabinets, disconnect the + and - 48V power leads from the existing power source, then reroute and connect them to the MFA150 power system. The connections are located under the top cover of the MFA150 power system. The connections at the TBC of the existing cabinet do not change.
- More information about connections for the MFA150 power system is located in 553-3001-210, *System installation procedures*. Refer to the documentation provided with the existing system for information about disconnecting and removing the old rectifier and batteries.

Figure 22-7**Typical arrangement using an MFA150 power system as a common power source**

An existing QCA13 power cabinet as a common power source

- A QCA13 power cabinet equipped with rectifiers can be used as a common power source for both the Option 51C and the existing cabinets as shown in Figure 22-8.
- For information about connections for the QCA13 power cabinet, refer to 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 22-8**Typical arrangement using a QCA 13 as a common power source**

Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 51C modules.

These cables connect the System Monitor to the SDI Paddle Board in the Core Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section '**Separate power source**' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 22-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 51C system:

- 1 Power up and initially load the Option 51C column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.

- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
 - 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *On-site software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
 - 4 The Meridian 1 Option 51C system is now operational.
-

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 51C column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 Connect an NT8D86 cable between the connector on the faceplate of the network card and the I/O panel of the Option 51C. One cable is required for each network loop.
- 2 Connect an NT8D73 shielded cable, up to 30 ft (9 m) in length, to the connector on the I/O panel of the Option 51C. Route the NT8D73 cable to the existing cabinet. Do not connect it to the Peripheral Buffer card in the existing cabinet at this time.

Note: Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

- 3 If required in the existing cabinet (see Note) connect an NT8D86 cable to the connector on the NT8D73 shielded cable from the Option 51C. Make sure that the connectors are locked together with the locking devices. Do not connect the cable to the faceplate of the Peripheral Buffer card at this time. It will be connected as part of the cutover procedure.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable.

Cutting-over

The following procedure describes how to cut-over to the Option 51C system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL12 or QCA13 unit**
Remove the fuses from the -48V fuse panel corresponding to each cabinet and column.
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.

Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.

 - **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
- 2 If required, perform power modifications to the existing cabinets.
- 3 In the existing cabinets, remove the wiring connecting the frame of the cabinet to the positive (+) connection of the TBC, and the wiring connecting the frame to the cabinet ground bus bar. Refer to Figures 22-5 through 22-7.

Note: This wiring was factory installed. It must be removed to avoid ground loops when existing cabinets are used with Meridian 1 modules.

- 4 This step applies only to Meridian 1 modules connected to a DC power source.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 22-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
 - the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.
- 5 This step applies only if a new common power source with battery backup connected to a QBL12 or QBL15 battery distribution box is to be used.

Note: This step does not apply if the common power source uses an MFA150 rectifier.

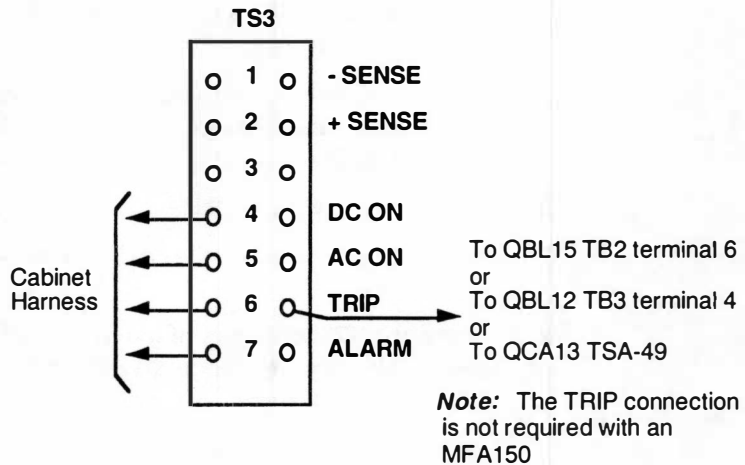
A TRIP lead must be connected to the TRIP connection on:

- the TRIP terminal on the terminal strip on the rectifier in existing cabinets equipped with a rectifier.
- the TRIP terminal of TS3 in existing cabinets not equipped with a rectifier.

The TRIP leads must be connected as follows.

If the existing rectifier is being removed from the cabinet, make the following wiring changes.

- a) If not already connected to TS3, tag and move the cabinet harness DC ON, AC ON, TRIP and ALARM leads presently connected on the rectifier to TS3 as shown in the above drawing. Depending on the type of existing cabinet, the TS3 is located either on the cabinet's TBC block, or on the QUT3 power unit.



- b) Install and connect a 16 AWG wire from terminal 6 (TRIP) on TS3 to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connections in each cabinet with 16 AWG wire.
- c) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.

Note: The DC ON, AC ON and ALARM lead functions are performed by the Meridian 1 module. Leaving these leads connected in the existing cabinets only extends the alarm indicators to the QPC84 power monitors. If you wish, you may leave these leads disconnected. However, the TRIP lead must be connected.

If the existing rectifier is to remain in the cabinet, make the following wiring changes.

- a) Install and connect a 16 AWG wire from the TRIP connection on the terminal strip of the rectifier to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connection on the terminal strip of the rectifier in each cabinet with 16 AWG wire. In existing cabinets not equipped with a rectifier (such as a QCA7 cabinet powered by a QCA8 cabinet), 'daisy chain' to the TRIP connection on TS3.
 - b) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.
- 6 Cross-connect the alarm cables as shown in Figure 22-10.
 - 7 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.
 - 8 Connect the NT8D86 cables (if provided) or NT8D73 shielded network cables from the Option 51C to the connector on the faceplate of the Peripheral Buffer circuit card in the existing cabinets.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable. The NT8D73 shielded cable can be connected directly to the connector of the Peripheral Buffer card.

—OR—

If the existing cabinet is equipped to suppress EMI, the NT8D73 shielded cable should be connected to its assigned filter connector. See 553-3001-150, *Upgrade Engineering* for more information.

- 9 Remove the QPC84 Power Monitor from the QCA28 cabinet and set switch C11, positions 1 and 2 to ON to disable monitoring the power in the CE shelf. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required. Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.

Note: Disregard any remaining alarm indications. Alarm indications should return to normal once the upgrade is completed and equipment that is no longer required has been removed as described later in this chapter.

- 10 Restore power to the cabinets and column by reinserting the removed fuse and resetting all circuit breakers to ON.

CAUTION

Do not remove the NT8D22 system monitor (XSM) from the column while the system is in service. Removing the XSM may cause the input circuit breakers on the existing cabinets to trip.

- 11 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.
-

Figure 22-9
NT8D46 cable types

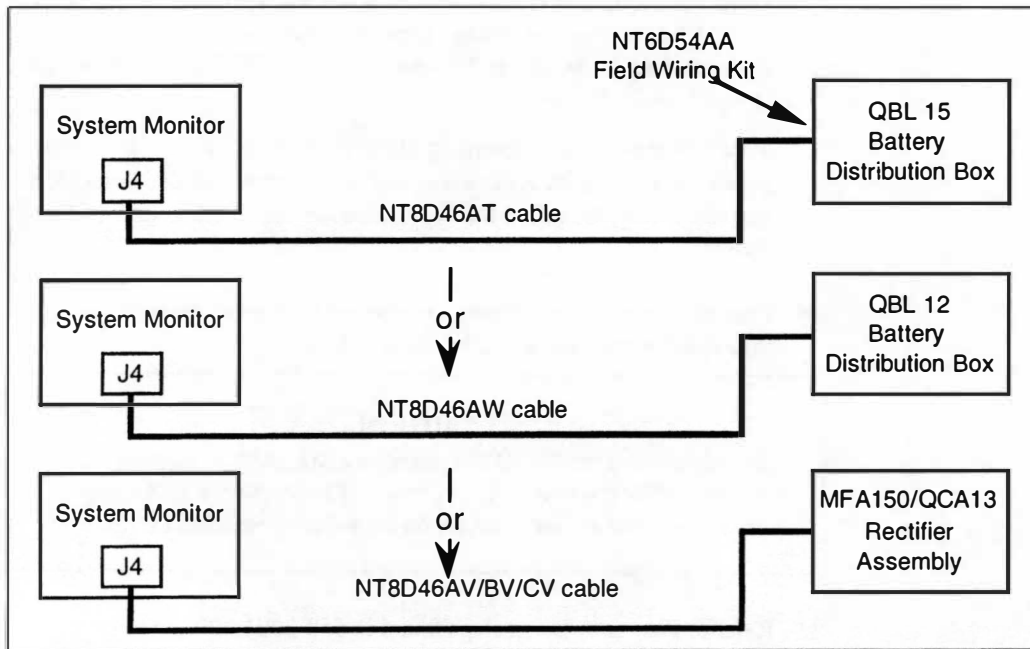
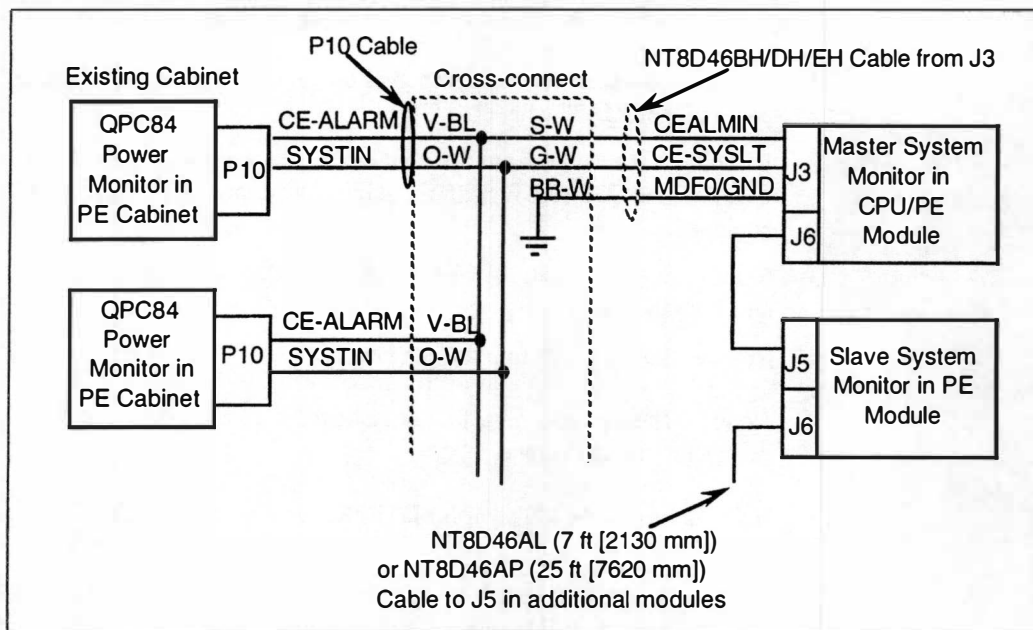


Figure 22-10
Connecting alarm cables between a cabinet and a column



Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

Removing equipment no longer required

The following procedure describes how to remove the equipment that is no longer required once the Option 51C is operating normally.

- 1 Set circuit breakers for the CE shelves on the QBL3 power distribution panel in the QCA28 cabinet to OFF.
- 2 Disconnect the cables from the front of all circuit cards on the QSD18 CE shelf, the QSD19 CE shelf, if equipped, and the QSD2 CE shelf, if equipped.
- 3 Remove circuit cards from the QSD18, QSD19, or QSD2 CE shelves and store them in a safe place.
- 4 Remove the tape unit from the cabinet.

Note: The tape unit must first be removed before the tape unit connector can be disconnected.

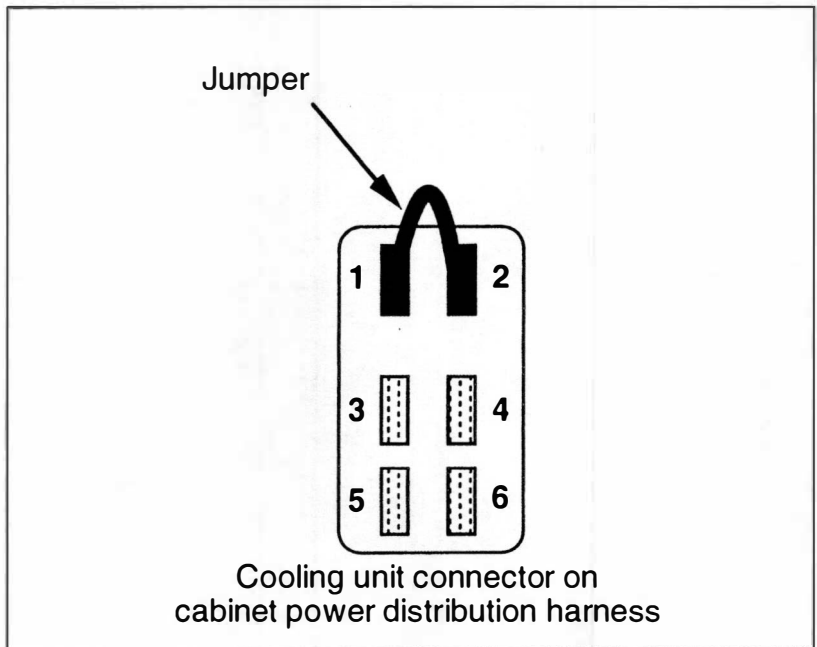
- 5 If you are using the CE shelf for DTI/PRI cards without clock reference:
 - Install DTI/PRI cards into card slots 6, 8, 10, and 12 in shelves QSD18 and QSD19, if equipped.
 - Install DTI/PRI cards into card slots 2, 6, 8, 10, and 12 in shelf QSD2, if equipped.
 - Replace the QPC85 Power Converter with a QPC190 or a QPC355 Power Converter to support maximum number of DTI/PRI cards.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the Core Network module of the Option 51C upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breakers for the CE shelves on the power distribution panel to ON.

- 6 If you are not going to use the CE shelf for DTI/PRI cards:
- Disconnect power connectors and alarm connectors from the QSD18 shelf, the QSD19, or the QSD2 shelf, if equipped. Tape all exposed power leads with electrical insulation tape.

Note: If the cabinet is equipped with an expansion CE shelf (a second CE shelf) disconnect and remove the wiring between the +5V, +12V, -12V, and LGND connections on the CE shelf.

- Disconnect all CE alarm connectors.
- Tape all exposed power leads with electrical insulation tape.
- Disconnect and remove the QUD4, 6 and /or 8 cooling unit. Place a jumper (a piece of 24 or 26 AWG bare wire or a paper clip can be used) across power monitor leads 1 and 2 of the cooling unit power connector as shown in Figure 22-11. This disables the alarm for the removed cooling unit.

Figure 22-11
Cooling unit alarm connection



SL-1 QCA37 cabinet upgrade to Meridian 1 Option 51C

This procedure is used to upgrade an SL-1 QCA37 cabinet (M, MS, ST, 21 or 21E) to Meridian 1 Option 51C. To upgrade to a Meridian 1 Option 51C system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51C:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51C operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 51C is operating with the new software provided with it.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51C operational.

However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Modular upgrade of an SL-1 QCA37 cabinet (M, MS, ST, 21 or 21E) to Meridian 1 Option 51C

Equipment required

Table 23-1 lists minimum hardware requirements needed to upgrade to a DC powered Meridian 1 Option 51C system.

Table 23-1

Minimum hardware requirements for a Meridian 1 Option 51C

Quantity			
AC System	DC System	Part number	Description
	1	NT6D41AB	CE Power Supply DC
1	1	NT6D63AA	Input/Output Processor (IO) Pack
1	1	NT6D64AA	Core Multi-Drive Unit (CMDU)
1	1	NT6D65AA	Core Network Interface (CNI) Pack
1	1	NT6D66AA	Call Processor (CP) Pack
1	1	NT6D6003	Core Bus Terminator (CBT) Pack
1		NT7D00AA	Top Cap AC
	1	NT7D00BA Rls 2	Top Cap DC
	1	NT7D09CA	Pedestal DC
	1	NT7D10CA	System Monitor Panel Assembly
	1	NT7D67CA	Power Distribution Unit and filter assembly
1	1	NT8D17AA Rls 9	Conference/TDS Card
1	1	NT8D22AC	System Monitor
1		NT8D27AB Rls 3	Pedestal AC
1		NT8D29AA Rls 4	CE/PE power supply AC
1	1	NT8D41AA Rls 2	2 Port SDI Paddle Board
1	1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	1	NT8D46BH	System Monitor to MDF Cable
-continued-			

Table 23-1 (continued)

Minimum hardware requirements for a Meridian 1 Option 51C

Quantity			
AC System	DC System	Part number	Description
1	1	NT8D52AA	Pedestal Blower unit AC
		NT8D52DC	Pedestal Blower Unit DC
1		NT8D53AB RIs 5	Power Distribution Unit AC
1	1	NT8D84AA	SDI Paddle Board to I/O Cable
	1	NT8D85AZ	CMA to CMA, 5 ft (1520 mm)
1	1	NT8D80AZ	CMA to CMA, 5 ft (1520 mm)
1	1	NT8D93AJ	SDI Paddle Board I/O to DTE/DCE, 16 ft (4875 mm)
1	1	NT8D99AB	Network to Network Module Cable 2 ft (610 mm)
1	1	NT9D11DC	Core Network (CN) Module
1	1	QPC43R	Peripheral Signaling Card
	1	QPC84Q	Power Monitor
1	1	QPC441B Series D	3 Port Extender Card
1	1	QPC477-9A	Bus Terminating Units
1	1	QPC477-10B	Bus Terminating Units

Note: The vintages shown on circuit cards in Table 23-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA37 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 51C Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 51C to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 51C to the existing cabinet.
- A second NT8D86 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Note: The second NT8D86 cable is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as a QCA7 or 8) do not require the second NT8D86 cable since the NT8D73 cable can be connected directly to the Peripheral Buffer connector. For existing cabinets equipped to suppress EMI, refer to 553-3001-150, *Upgrade Engineering*.

Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

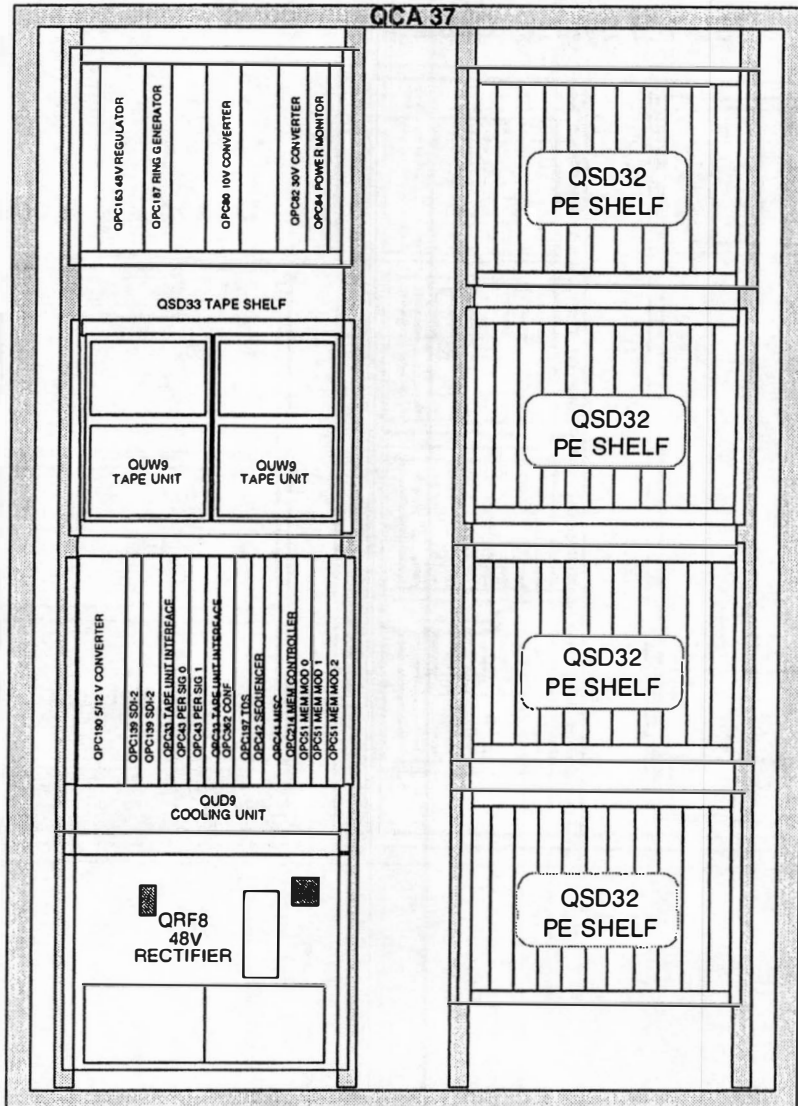
Upgrading consists of:

- installing the Meridian 1 Option 51C system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 23-1 shows a typical QCA37 cabinet and Figure 23-2 shows a QCA37 cabinet that has been upgraded to Meridian 1 Option 51C.

Figure 23-1
Typical QCA37 cabinet

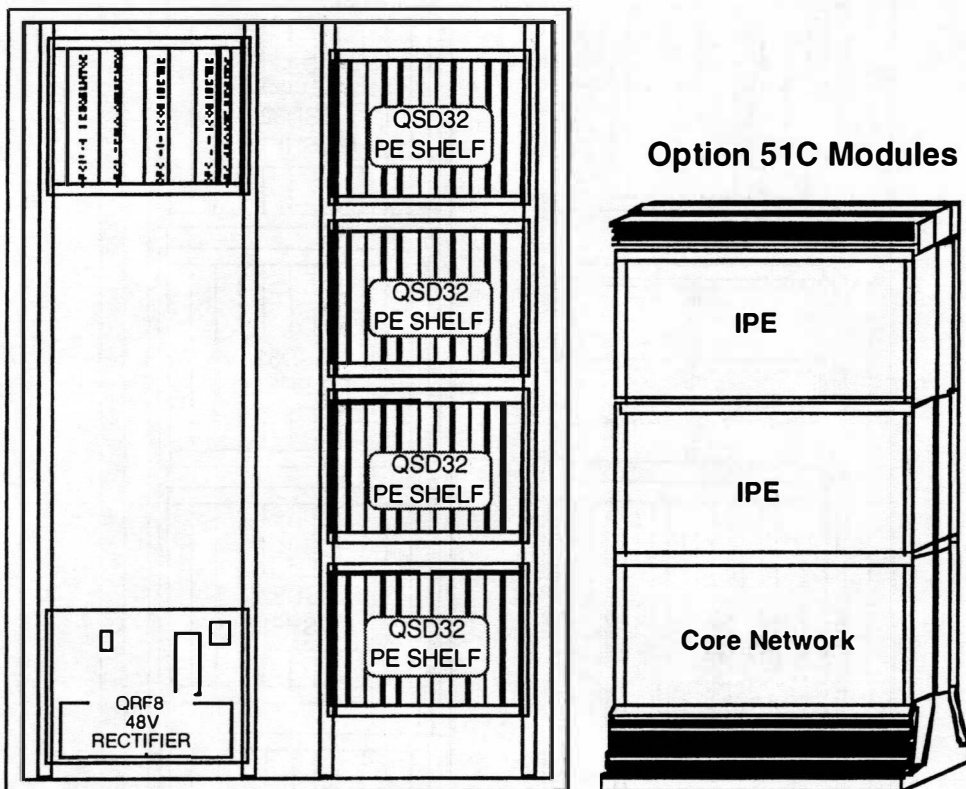


553-5712

Figure 23-2

Typical QCA37 cabinet that has been upgraded to Meridian 1 Option 51C

SL-1 M System Cabinet



Installing the Meridian 1 Option 51C system

The Option 51C equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, Core Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 51C equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 13-2 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.
- Install cabling:
 - Cable common equipment

- Cable network loops (within the Option 51C columns only).

Note: Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.

- Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 51C equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 23-3 shows Option 51C circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 23-2

NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 23-2 (continued)

NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 23-2 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves		Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."							
For each slave, indicates the slave address		Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."							
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master			on					
	slave			off					
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

Table 23-2 (continued)

NT8D22 system monitor — settings for total number of slaves — SW2 on master

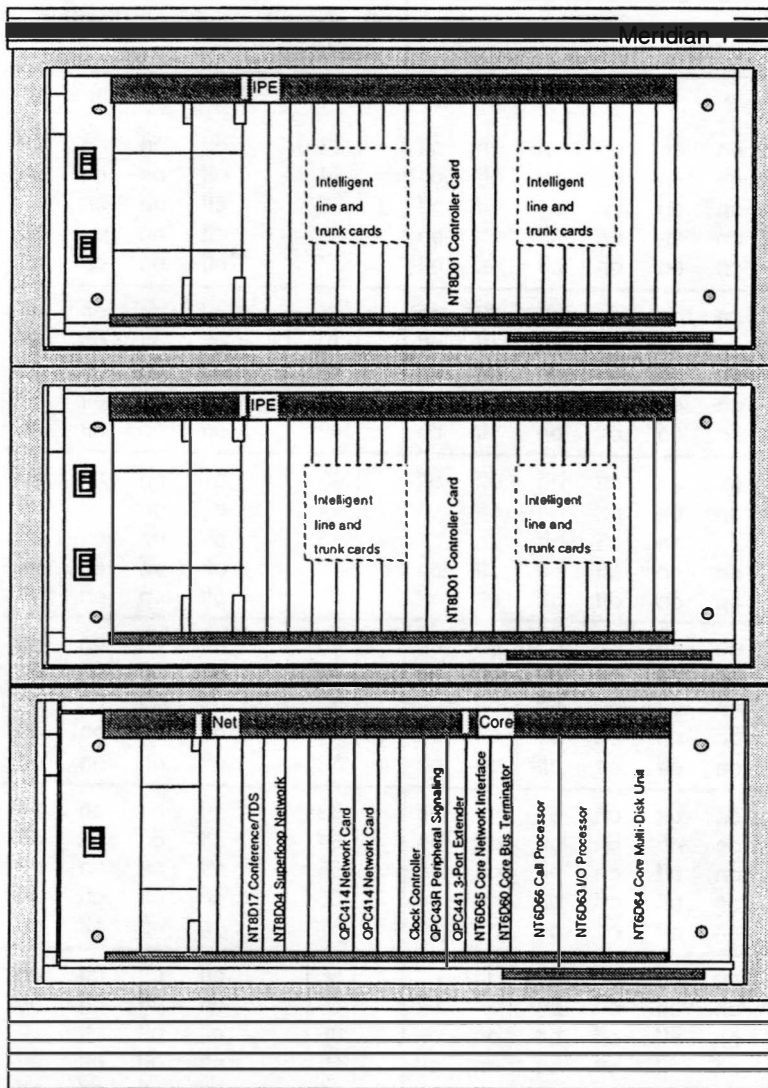
How many slave units		Switch position						How many slave units		Switch position					
		3	4	5	6	7	8			3	4	5	6	7	8
0		on	on	on	on	on	on	32		off	on	on	on	on	on
1		on	on	on	on	on	off	33		off	on	on	on	on	off
2		on	on	on	on	off	on	34		off	on	on	on	off	on
3		on	on	on	on	off	off	35		off	on	on	on	off	off
4		on	on	on	off	on	on	36		off	on	on	off	on	on
5		on	on	on	off	on	off	37		off	on	on	off	on	off
6		on	on	on	off	off	on	38		off	on	on	off	off	on
7		on	on	on	off	off	off	39		off	on	on	off	off	off
8		on	on	off	on	on	on	40		off	on	off	on	on	on
9		on	on	off	on	on	off	41		off	on	off	on	on	off
10		on	on	off	on	off	on	42		off	on	off	on	off	on
11		on	on	off	on	off	off	43		off	on	off	on	off	off
12		on	on	off	off	on	on	44		off	on	off	off	on	on
13		on	on	off	off	on	off	45		off	on	off	off	on	off
14		on	on	off	off	off	on	46		off	on	off	off	off	on
15		on	on	off	off	off	off	47		off	on	off	off	off	off
16		on	off	on	on	on	on	48		off	off	on	on	on	on
17		on	off	on	on	on	off	49		off	off	on	on	on	off
18		on	off	on	on	off	on	50		off	off	on	on	off	on
19		on	off	on	on	off	off	51		off	off	on	on	off	off
20		on	off	on	off	on	on	52		off	off	on	off	on	on
21		on	off	on	off	on	off	53		off	off	on	off	on	off
22		on	off	on	off	off	on	54		off	off	on	off	off	on
23		on	off	on	off	off	off	55		off	off	on	off	off	off
24		on	off	off	on	on	on	56		off	off	off	on	on	on
25		on	off	off	on	on	off	57		off	off	off	on	on	off
26		on	off	off	on	off	on	58		off	off	off	on	off	on
27		on	off	off	on	off	off	59		off	off	off	on	off	off
28		on	off	off	off	on	on	60		off	off	off	off	on	on
29		on	off	off	off	on	off	61		off	off	off	off	on	off
30		on	off	off	off	off	on	62		off	off	off	off	off	on
31		on	off	off	off	off	off	63		off	off	off	off	off	off
— continued —															

Table 23-2 (continued)

NT8D22 system monitor — slave address — SW2 on slave

Slave unit address							Position							Slave unit address							Position						
	3	4	5	6	7	8		3	4	5	6	7	8		3	4	5	6	7	8		3	4	5	6	7	8
1	on	on	on	on	on	off	33	off	on	on	on	on	off	33	off	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on	34	off	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off	35	off	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on	36	off	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off	37	off	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on	38	off	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off	39	off	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on	40	off	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off	41	off	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on	42	off	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off	43	off	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on	44	off	on	off	off	on	on	44	off	on	off	on	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off	45	off	on	off	off	on	off	45	off	on	off	on	off	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on	46	off	on	off	off	off	on	46	off	on	off	off	on	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off	47	off	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on	48	off	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off	49	off	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on	50	off	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off	51	off	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on	52	off	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off	53	off	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on	54	off	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off	55	off	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on	56	off	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off	57	off	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on	58	off	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off	59	off	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on	60	off	off	off	off	on	on	60	off	off	off	on	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off	61	off	off	off	off	on	off	61	off	off	off	on	off	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on	62	off	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off	63	off	off	off	off	off	off	63	off	off	off	off	off	off
32	off	on	on	on	on	on																					

Figure 23-3
Meridian 1 Option 51C Core Network and IPE modules



553-6133

Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 51C: one that is designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 51C, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Note: Depending on the power configuration used it may be required to do modifications to the existing cabinets. If modifications are required, do them as part of the cut-over procedures (described later in this document) to avoid unnecessary interruption of service to the end users.

Connect the DC power to the Option 51C columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 51C equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 51C module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 51C modules.

- a new power source installed in conjunction with the Option 51C.

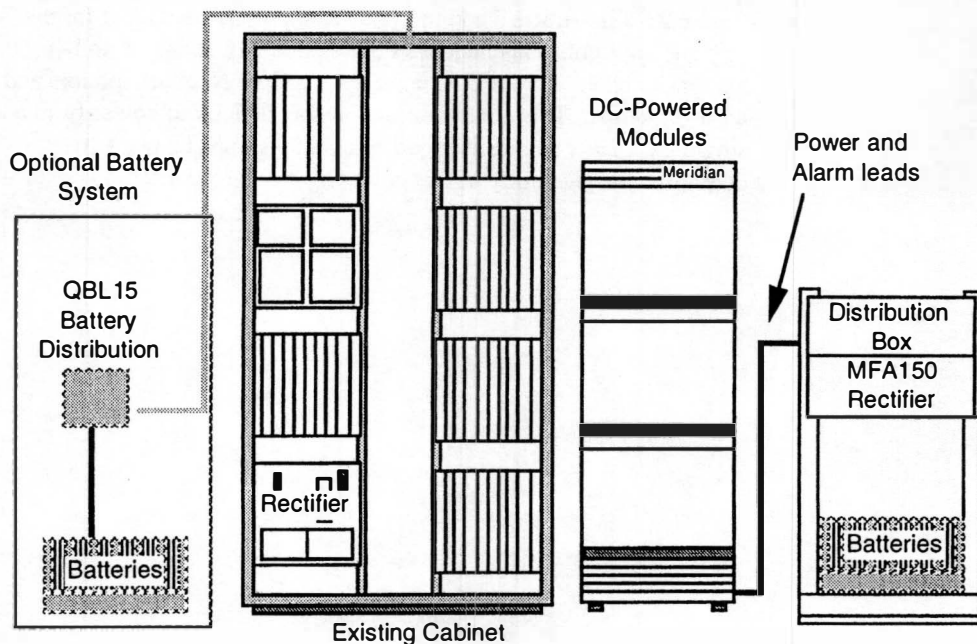
To determine the power requirements for the Option 51C system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 23-4 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 51C modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 51C column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 23-4

Typical arrangement of independently DC-powered Meridian 1 Option 51C modules

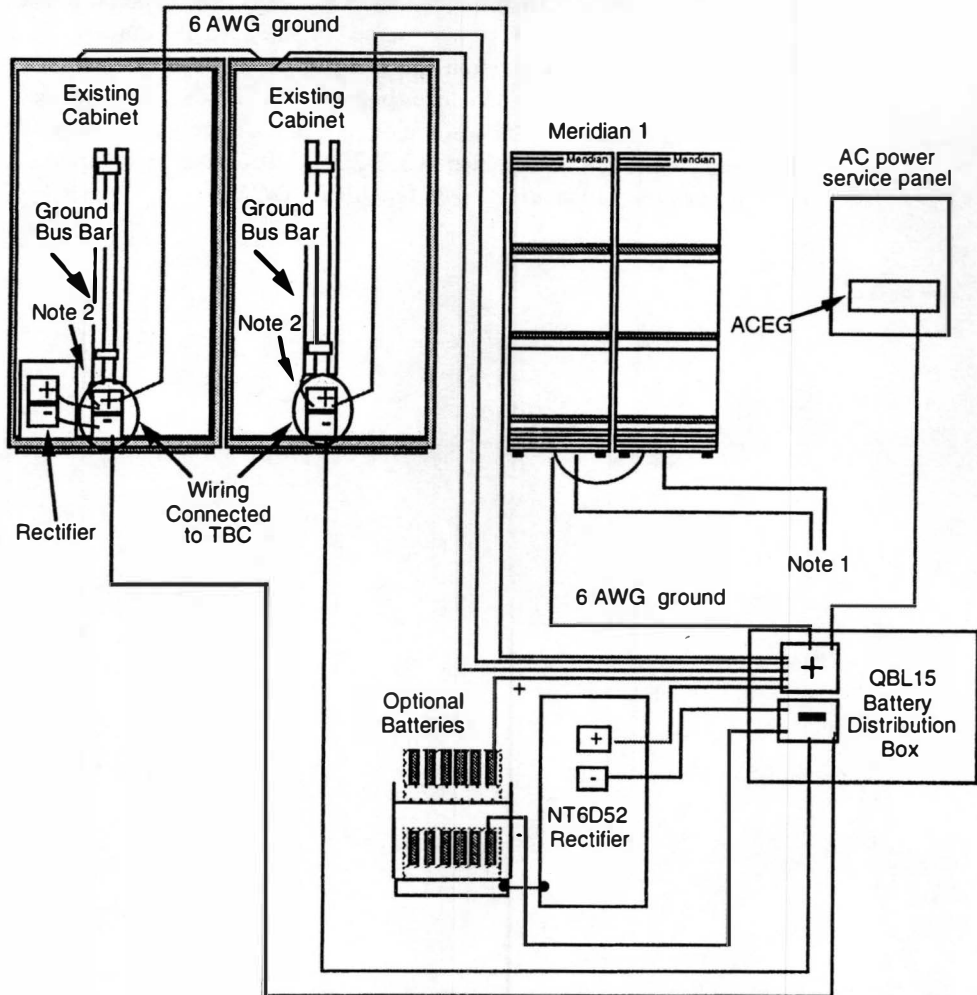


Note: An MFA150 cannot share a battery string connected to QBL15, QBL12 or QCA13. A separate battery string is required for the MFA150.

Common power source

Existing cabinet rectifier as a common power source

- When the existing cabinet DC power source is used as a common power source for the cabinet and the column, any QSD4 rectifier will have to be replaced with a QRF8 rectifier and the existing battery distribution box will have to be replaced with a QBL15 battery distribution box. For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 23-5 illustrates a common power supply arrangement for the upgraded system. This includes both Option 51C modules and the existing cabinet. Option 51C consists of a Core Network module and an IPE module. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

Figure 23-5**Typical arrangement using a common DC power supply with optional battery backup**

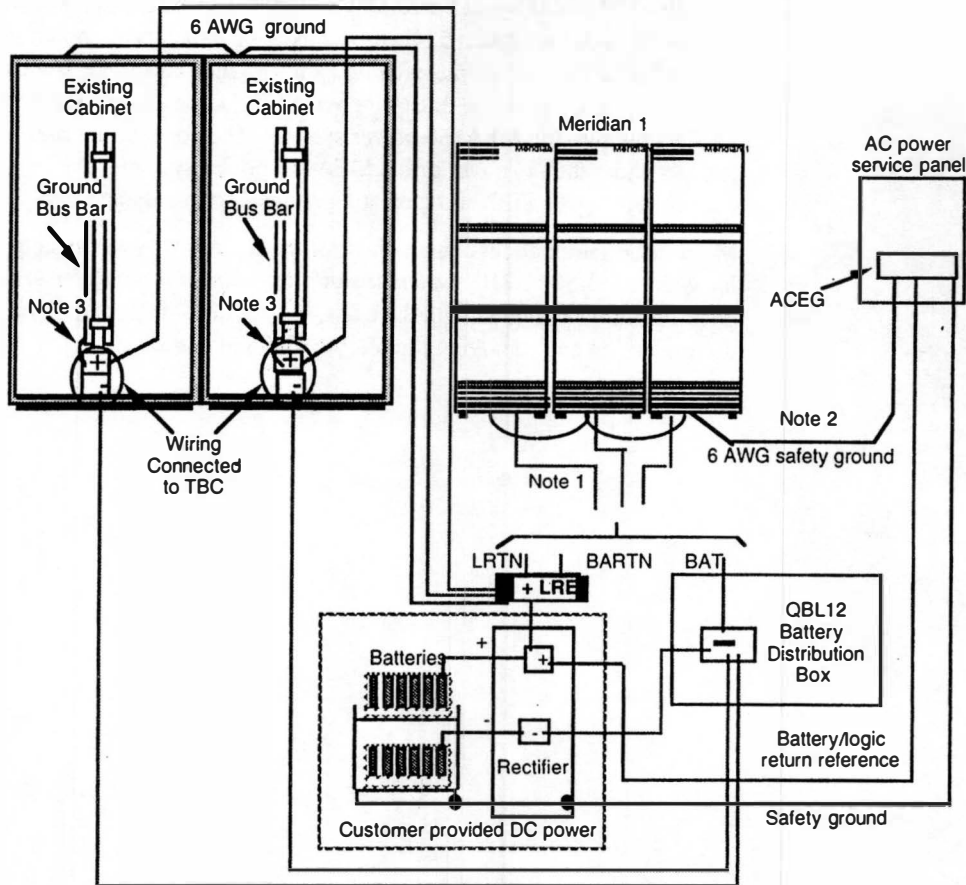
Note 1: DC power feeds from the QBL15 to the Meridian 1. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

Note 2: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

Customer provided power as a common power source

- A QBL12 Battery Distribution Box is normally used to connect to a customer provided DC power source. Figure 23-6 illustrates a customer provided common power supply arrangement for the upgraded system. This includes both Option 51C modules and the existing cabinet. A full description of QBL12 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 23-6**Typical arrangement using a customer provided common DC power supply**

Note 1: DC power feeds. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

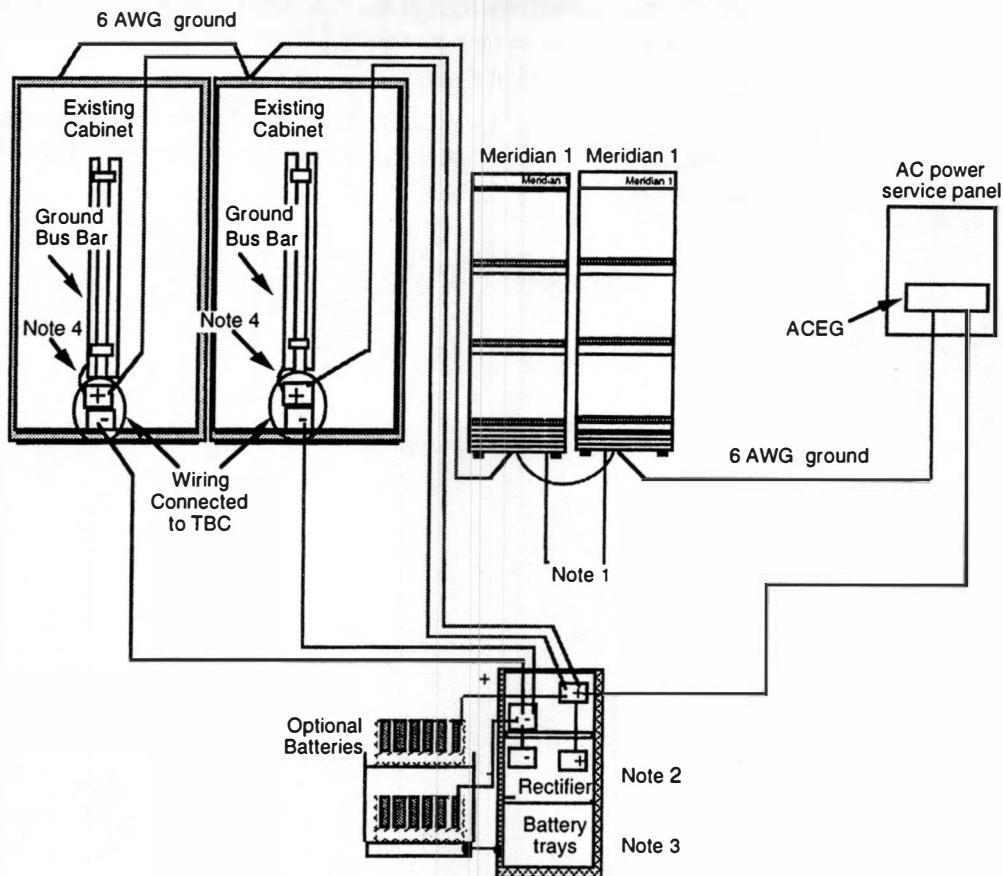
Note 2: With customer provided power equipment, the Meridian 1 frame requires a direct connection to the ACEG. In addition, the positive bus bar in the customer provided equipment must connect to the ACEG.

Note 3: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

An MFA150 power system as a common power source

- An MFA150 power system assembly can be used as a common power source for both the Option 51C and the existing cabinets as shown in Figure 23-7. To connect the existing cabinets, disconnect the + and - 48V power leads from the existing power source, then reroute and connect them to the MFA150 power system. The connections are located under the top cover of the MFA150 power system. The connections at the TBC of the existing cabinet do not change.
- More information about connections for the MFA150 power system is located in 553-3001-210, *System installation procedures*. Refer to the documentation provided with the existing system for information about disconnecting and removing the old rectifier and batteries.

Figure 23-7**Typical arrangement using an MFA150 power system as a common power source**

Note 1: DC power feeds from the MFA150 to the Meridian 1. Each feed consists of two BAT (-), two BRTN (+) and one LRTN (+) conductors. If required, conductors can be run in conduits.

Note 2: The MFA 150 power system may be equipped with one or two power shelves for a maximum of 75 amps or 150 amps respectively.

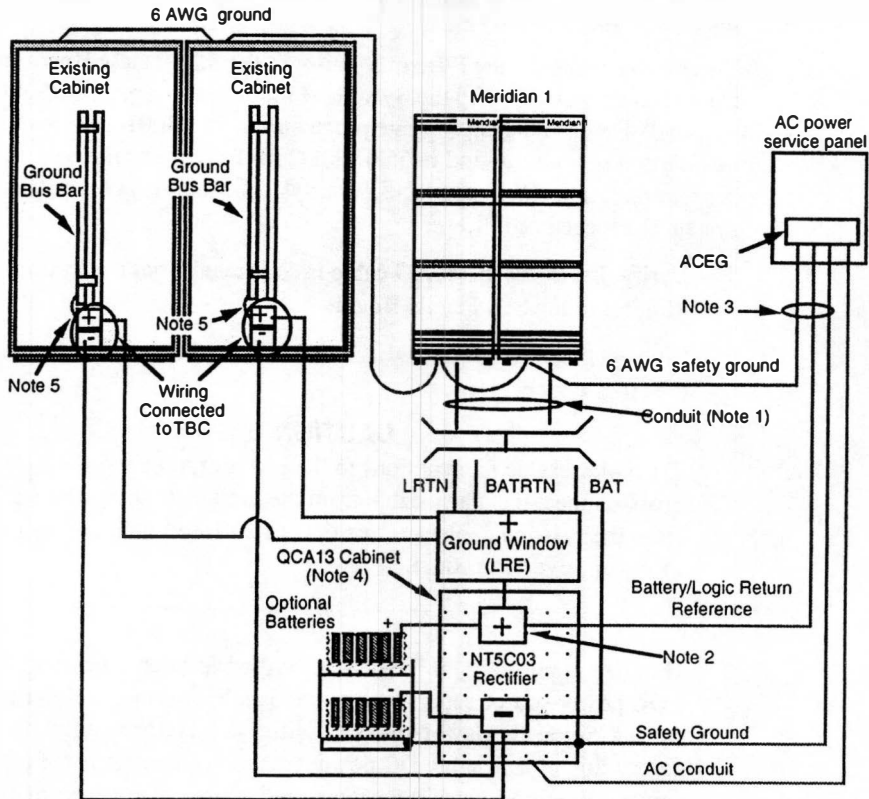
Note 3: Batteries may be installed in two optional battery trays located under the rectifier shelves.

Note 4: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

An existing QCA13 power cabinet as a common power source

- A QCA13 power cabinet equipped with rectifiers can be used as a common power source for both the Option 51C and the existing cabinets as shown in Figure 23-8.
- For information about connections for the QCA13 power cabinet, refer to 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 23-8**Typical arrangement using a QCA 13 as a common power source**

Note 1: DC power feeds to Meridian 1 pedestals. Each feed consists of two BAT (-), two BATRTN (+), and one LRTN (+) conductors. If required, conductors can be run in conduit as shown. BAT (-) connects to the appropriate fuse in the rectifier cabinet.

Note 2: The QCA13 cabinet does not contain a bus for terminating individual battery and logic returns. A ground window should be used to consolidate all battery and logic returns.

Note 3: The Battery/Logic Return Reference wiring and the safety ground wiring must be #6 AWG, minimum.

Note 4: Up to four NT5C03 rectifiers can be equipped in a QCA13 cabinet for a total of 200 amps.

Note 5: WARNING— Do not remove the following connections until instructed to do so at time of cut-over.

At time of cut-over, remove all wires connecting the frame of the cabinet to the positive (+) connection on the TBC, and from the frame of the cabinet to the ground bus bar. These are factory installed connections. They must be removed at time of cut-over to isolate the cabinet frame ground from the +48V in order to avoid ground loops.

Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 51C modules.

These cables connect the System Monitor to the SDI Paddle Board in the Core Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

-
- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section 'Separate power source' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 23-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 51C system:

- 1 Power up and initially load the Option 51C column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.

- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
- 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
- 4 The Meridian 1 Option 51C system is now operational.

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 51C column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 Connect an NT8D86 cable between the connector on the faceplate of the network card and the I/O panel of the Option 51C. One cable is required for each network loop.
- 2 Connect an NT8D73 shielded cable, up to 30 ft (9 m) in length, to the connector on the I/O panel of the Option 51C. Route the NT8D73 cable to the existing cabinet. Do not connect it to the Peripheral Buffer card in the existing cabinet at this time.

Note: Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

- 3 If required in the existing cabinet (see Note) connect an NT8D86 cable to the connector on the NT8D73 shielded cable from the Option 51C. Make sure that the connectors are locked together with the locking devices. Do not connect the cable to the faceplate of the Peripheral Buffer card at this time. It will be connected as part of the cutover procedure.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable.

Cutting-over

The following procedure describes how to cut-over to the Option 51C system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL12 or QCA13 unit**
Remove the fuses from the -48V fuse panel corresponding to each cabinet and column.
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.
Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.
 - **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
- 2 If required, perform power modifications to the existing cabinets.
- 3 In the existing cabinets, remove the wiring connecting the frame of the cabinet to the positive (+) connection of the TBC, and the wiring connecting the frame to the cabinet ground bus bar. Refer to Figures 23-5 through 23-7.

Note: This wiring was factory installed. It must be removed to avoid ground loops when existing cabinets are used with Meridian 1 modules.
- 4 This step applies only to Meridian 1 modules connected to a DC power source.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 23-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
 - the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.
- 5 This step applies only if a new common power source with battery backup connected to a QBL12 or QBL15 battery distribution box is to be used.

Note: This step does not apply if the common power source uses an MFA150 rectifier.

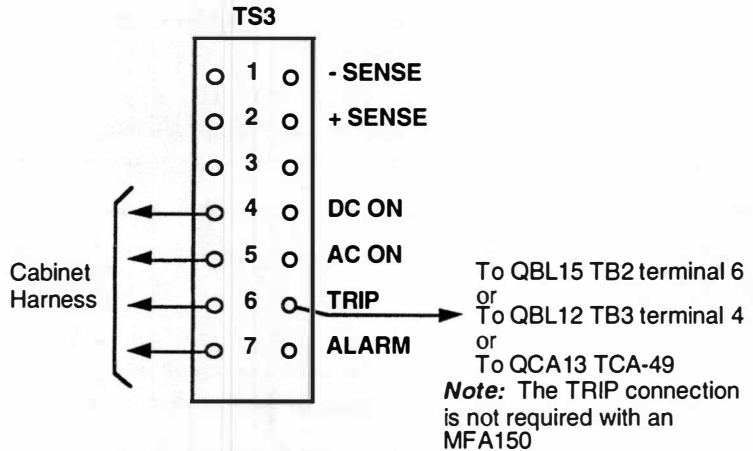
A TRIP lead must be connected to the TRIP connection on:

- the TRIP terminal on the terminal strip on the rectifier in existing cabinets equipped with a rectifier.
- the TRIP terminal of TS3 in existing cabinets not equipped with a rectifier.

The TRIP leads must be connected as follows.

If the existing rectifier is being removed from the cabinet, make the following wiring changes.

- a) If not already connected to TS3, tag and move the cabinet harness DC ON, AC ON, TRIP and ALARM leads presently connected on the rectifier to TS3 as shown in the above drawing. Depending on the type of existing cabinet, the TS3 is located either on the cabinet's TBC block, or on the QUT3 power unit.



- b) Install and connect a 16 AWG wire from terminal 6 (TRIP) on TS3 to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connections in each cabinet with 16 AWG wire.
- c) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.

Note: The DC ON, AC ON and ALARM lead functions are performed by the Meridian 1 module. Leaving these leads connected in the existing cabinets only extends the alarm indicators to the QPC84 power monitors. If you wish, you may leave these leads disconnected. However, the TRIP lead must be connected.

If the existing rectifier is to remain in the cabinet, make the following wiring changes.

- a) Install and connect a 16 AWG wire from the TRIP connection on the terminal strip of the rectifier to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connection on the terminal strip of the rectifier in each cabinet with 16 AWG wire. In existing cabinets not equipped with a rectifier (such as a QCA7 cabinet powered by a QCA8 cabinet), 'daisy chain' to the TRIP connection on TS3.
 - b) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.
- 6 Cross-connect the alarm cables as shown in Figure 23-10.
 - 7 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.
 - 8 Connect the NT8D86 cables (if provided) or NT8D73 shielded network cables from the Option 51C to the connector on the faceplate of the Peripheral Buffer circuit card in the existing cabinets.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable. The NT8D73 shielded cable can be connected directly to the connector of the Peripheral Buffer card.

—OR—

If the existing cabinet is equipped to suppress EMI, the NT8D73 shielded cable should be connected to its assigned filter connector. See 553-3001-150, *Upgrade Engineering* for more information.

- 9 Remove the QPC84 Power Monitor from the QCA37 cabinet and set switch C11, position 2 to ON. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required. Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.

Note: Disregard any remaining alarm indications. Alarm indications should return to normal once the upgrade is completed and equipment that is no longer required has been removed as described later in this chapter.

- 10 Restore power to the cabinets and column by reinserting the removed fuse and resetting all circuit breakers to ON.

CAUTION

Do not remove the NT8D22 system monitor (XSM) from the column while the system is in service. Removing the XSM may cause the input circuit breakers on the existing cabinets to trip.

- 11 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Figure 23-9
NT8D46 cable types

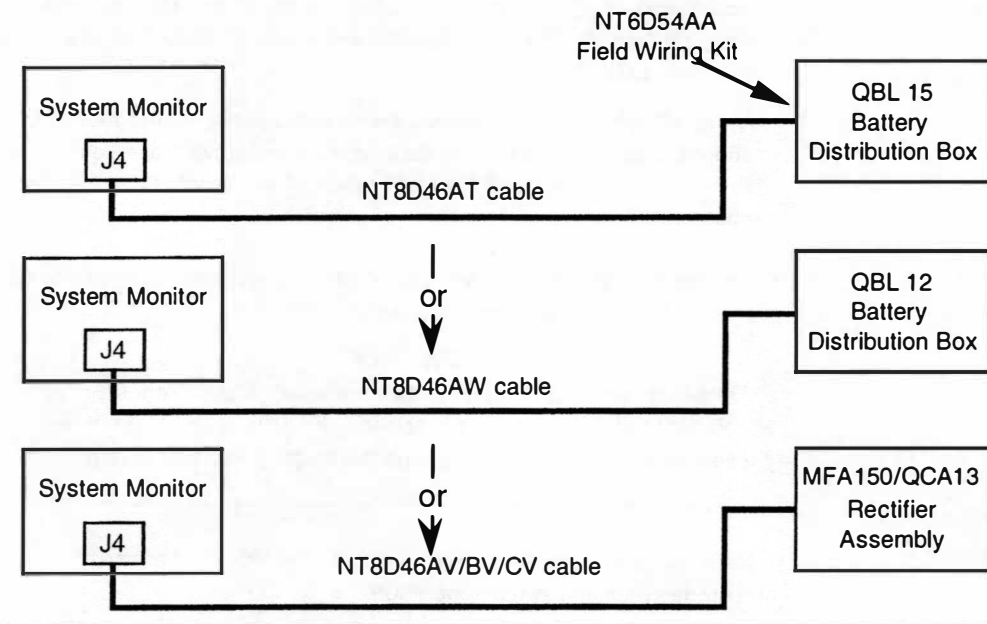
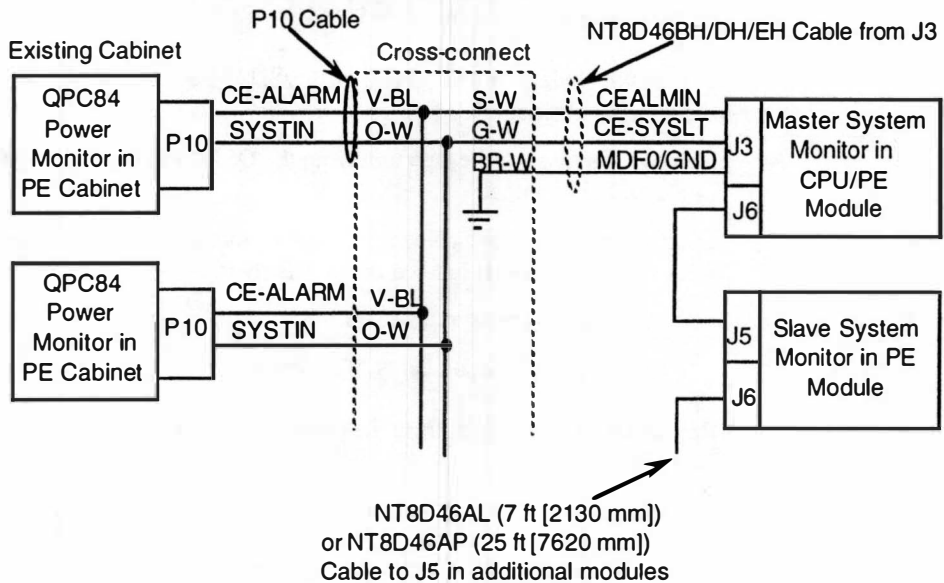


Figure 23-10
Connecting alarm cables between a cabinet and a column



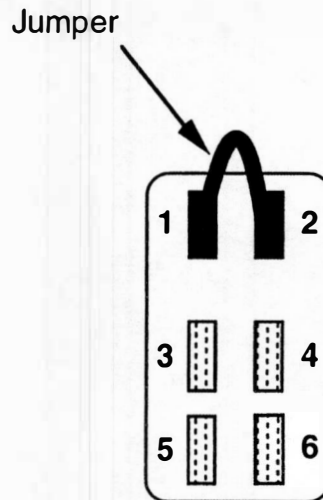
Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

Removing equipment no longer required

The following procedure describes how to remove the equipment that is no longer required once the Option 51C is operating normally.

- 1 Set the CE shelf circuit breaker on the QSD23 power control shelf in the QCA37 cabinet to OFF.
- 2 Remove the fuse for the tape unit from the QSD23 power control shelf in the QCA37 cabinet.
- 3 Disconnect and remove cables from connectors on the faceplate of the following circuit cards located on the CE shelf:
 - QPC376 network circuit cards.
 - QPC139 SDI2 circuit cards, if equipped.
- 4 Remove the circuit cards from the QSD26 CE shelf and store them in a safe place.
- 5 Remove the tape unit from the cabinet.
- 6 If you are using the CE shelf for DTI/PRI cards:
 - Install DTI/PRI cards in card slots 2, 6, 8, 10, and 12.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the Core Network module of the Option 51C upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breaker for the CE shelf on the QSD23 power control shelf to ON.
- 7 If you are not going to use the CE shelf for DTI/PRI cards:
 - Disconnect power connectors and alarm connectors from the QSD26 shelf. Tape all exposed power leads with electrical insulation tape.
 - Disconnect all CE alarm connectors.
 - Disconnect and remove the QUD9 cooling unit. Place a jumper (a piece of 24 or 26 AWG bare wire or a paper clip can be used) across power monitor leads 1 and 2 of the cooling unit power connector as shown in Figure 23-11. This disables the alarm for the removed cooling unit.

Figure 23-11
Cooling unit alarm connection



Cooling unit connector on
cabinet power distribution harness

SL-1 QCA58 or QCA96 cabinet upgrade to Meridian 1 Option 51C

This procedure is used to upgrade an SL-1 QCA58 or QCA96 cabinet (NT, N, or Option 51) with release 15 to 17 software to a Meridian 1 Option 51C. To upgrade to a Meridian 1 Option 51C RIs 20 system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware using the card upgrade method and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51C:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51 operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 51C is operating with the new software provided with it.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51C operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Modular upgrade of an SL-1 QCA58 or QCA96 cabinet (N, NT or 61 Rls 15-17) to Meridian 1 Option 51C

Equipment required

Table 24-2 lists minimum hardware requirements needed to upgrade a QCA58 or QCA96 cabinet to a DC powered Meridian 1 Option 51C.

Table 24-2

Minimum hardware requirements for a Meridian 1 Option 51C

Quantity			
AC System	DC System	Part number	Description
	1	NT6D41AB	CE Power Supply DC
1	1	NT6D63AA	Input/Output Processor (IO) Pack
1	1	NT6D64AA	Core Multi-Drive Unit (CMDU)
1	1	NT6D65AA	Core Network Interface (CNI) Pack
1	1	NT6D66AA	Call Processor (CP) Pack
1	1	NT6D6003	Core Bus Terminator (CBT) Pack
1		NT7D00AA	Top Cap AC
	1	NT7D00BA Rls 2	Top Cap DC
	1	NT7D09CA	Pedestal DC
	1	NT7D10CA	System Monitor Panel Assembly
	1	NT7D67CA	Power Distribution Unit and filter assembly
1	1	NT8D17AA Rls 9	Conference/TDS Card
1	1	NT8D22AC	System Monitor
1		NT8D27AB Rls 3	Pedestal AC
1		NT8D29AA Rls 4	CE/PE power supply AC
1	1	NT8D41AA Rls 2	2 Port SDI Paddle Board
1	1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	1	NT8D46BH	System Monitor to MDF Cable
-continued-			

Table 24-1 (continued)

Minimum hardware requirements for a Meridian 1 Option 51C

Quantity			
AC System	DC System	Part number	Description
1		NT8D52AA	Pedestal Blower unit AC
	1	NT8D52DC	Pedestal Blower Unit DC
1		NT8D53AB Rls 5	Power Distribution Unit AC
1	1	NT8D84AA	SDI Paddle Board to I/O Cable
	1	NT8D85AZ	CMA to CMA, 5 ft (1520 mm)
1	1	NT8D80AZ	CMA to CMA, 5 ft (1520 mm)
1	1	NT8D93AJ	SDI Paddle Board I/O to DTE/DCE, 16 ft (4875 mm)
1	1	NT8D99AB	Network to Network Module Cable 2 ft (610 mm)
1	1	NT9D11DC	Core Network (CN) Module
1	1	QPC43R	Peripheral Signaling Card
	1	QPC84Q	Power Monitor
1	1	QPC441B Series D	3 Port Extender Card
1	1	QPC477-9A	Bus Terminating Units
1	1	QPC477-10B	Bus Terminating Units

Note: The vintages shown on circuit cards in Table 24-2 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA58 and QCA96 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 51C Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 51C to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 51C to the existing cabinet.
- A second NT8D86 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Note: The second NT8D86 cable is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as a QCA7 or 8) do not require the second NT8D86 cable since the NT8D73 cable can be connected directly to the Peripheral Buffer connector. For existing cabinets equipped to suppress EMI, refer to 553-3001-150, *Upgrade Engineering*.

Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 51C system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 24-1 shows a typical QCA58 cabinet and Figure 24-2 shows a QCA58 cabinet that has been upgraded to Meridian 1 Option 51C.

Figure 24-1
Typical QCA58 cabinet

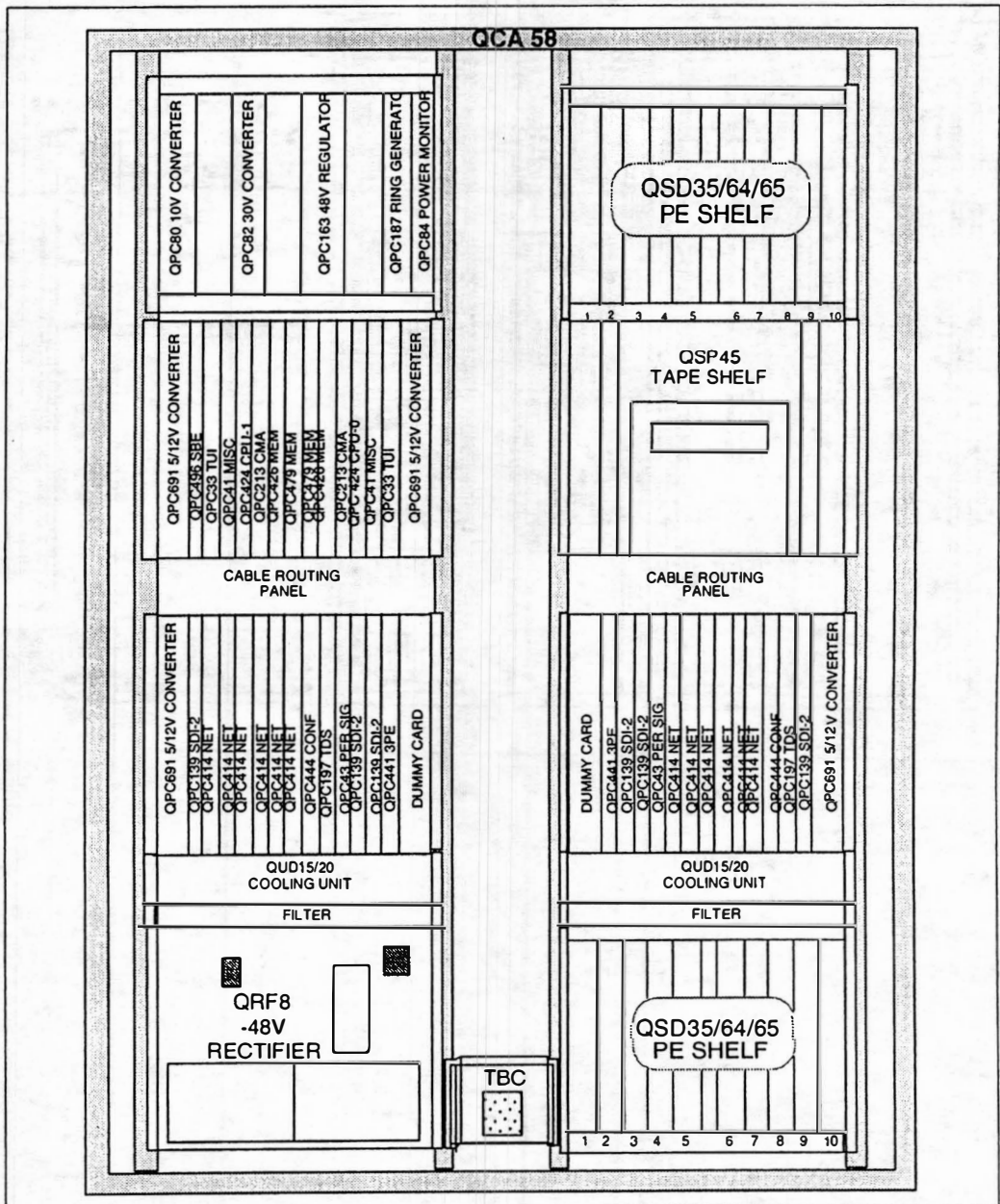
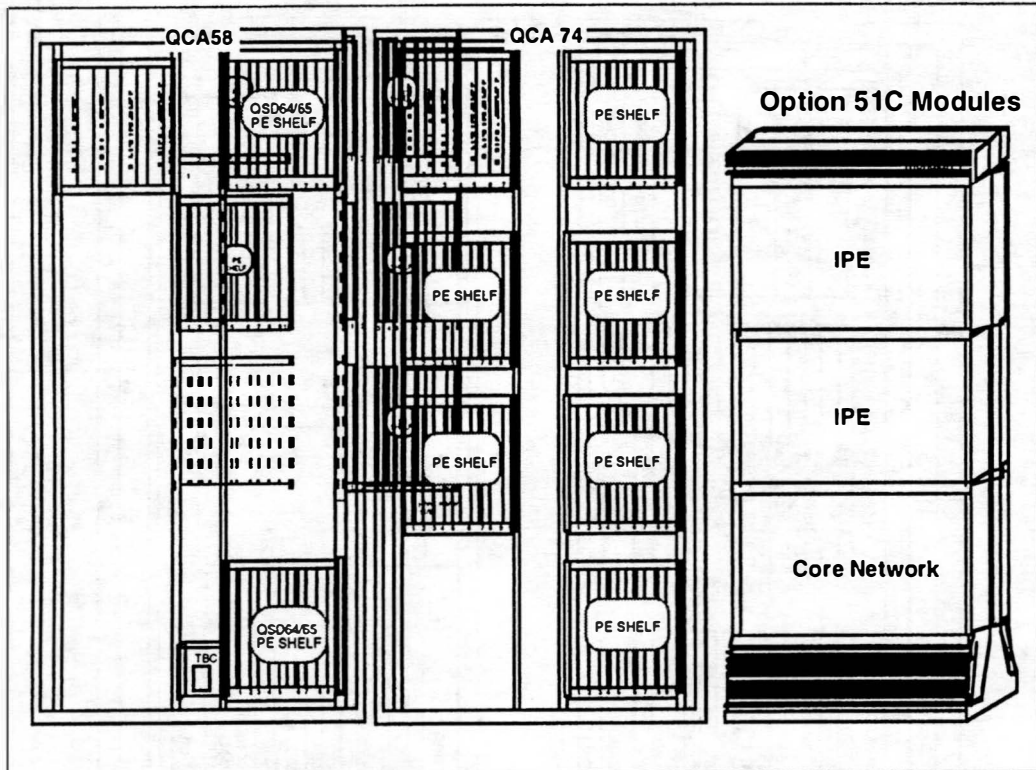


Figure 24-2

Typical QCA58 cabinet that has been upgraded to Meridian 1 Option 51C



Installing the Meridian 1 Option 51C system

The Option 51C equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, Core Network modules, IPE module, circuit cards, and top cap. CMDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 51C equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 24-3 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.
- Install cabling:

- Cable common equipment
- Cable network loops (within the Option 51C columns only).

Note: Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.

- Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 51C equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 24-3 shows Option 51C circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 24-3**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
3	ON	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
	OFF	
4	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
5	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
— continued —		

Table 24-3 (continued)

NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 24-3 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves				Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."					
For each slave, indicates the slave address				Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."					
SW3 indication		Position							
		1	2	3	4				
CTA	master slave	on off							
CTR	master slave		on off						
FAIL	master slave					on off			
MAJOR	master slave								on off
— continued —									

Table 24-3 (continued)

NT8D22 system monitor — settings for total number of slaves — SW2 on master

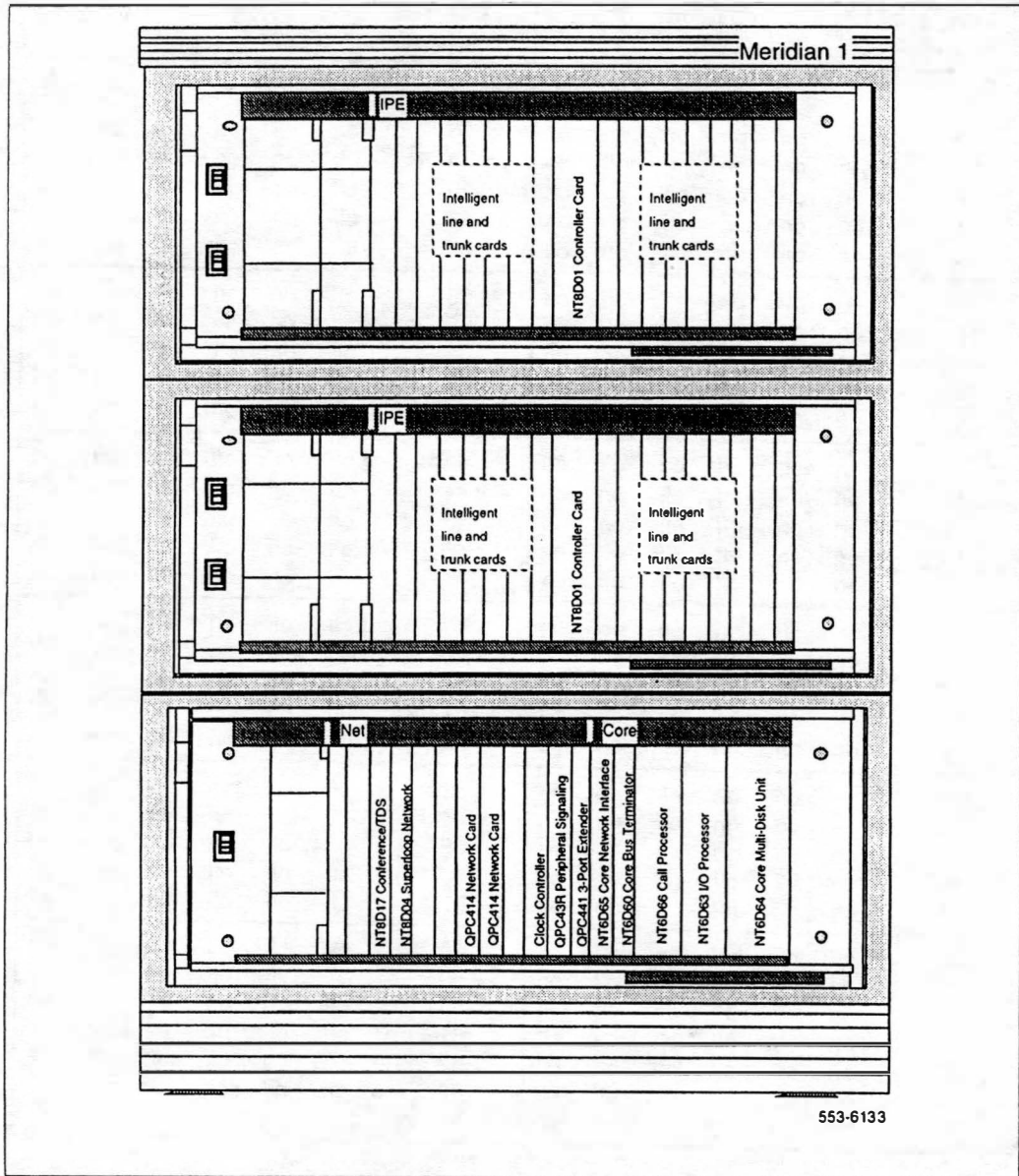
How many slave units	Switch position						How many slave units	Switch position					
	3	4	5	6	7	8		3	4	5	6	7	8
0	on	on	on	on	on	on	32	off	on	on	on	on	on
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
— continued —													

Table 24-3 (continued)

NT8D22 system monitor — slave address — SW2 on slave

Slave unit address	Position						Slave unit address	Position					
	3	4	5	6	7	8		3	4	5	6	7	8
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
32	off	on	on	on	on	on							

Figure 24-3
Meridian 1 Option 51C Core Network and IPE modules



Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 51C: one designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 51C, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Note: Depending on the power configuration used it may be required to do modifications to the existing cabinets. If modifications are required, do them as part of the cut-over procedures (described later in this document) to avoid unnecessary interruption of service to the end users.

Connect the DC power to the Option 51C columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 51C equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 51C module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 51C modules.

24-18 SL-1 QCA58 or QCA96 cabinet upgrade to Meridian 1 Option 51C

- a new power source installed in conjunction with the Option 51C.

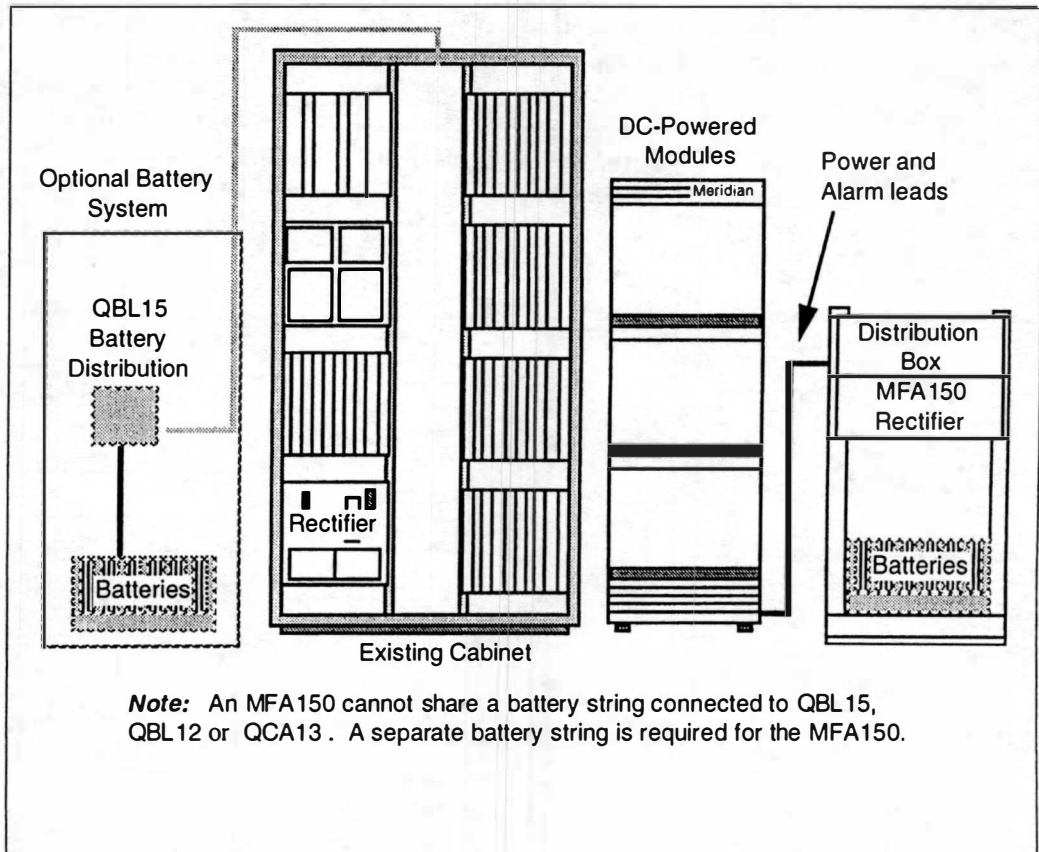
To determine the power requirements for the Option 51C system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 24-4 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 51C modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 51C column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 24-4

Typical arrangement of independently DC-powered Meridian 1 Option 51C modules



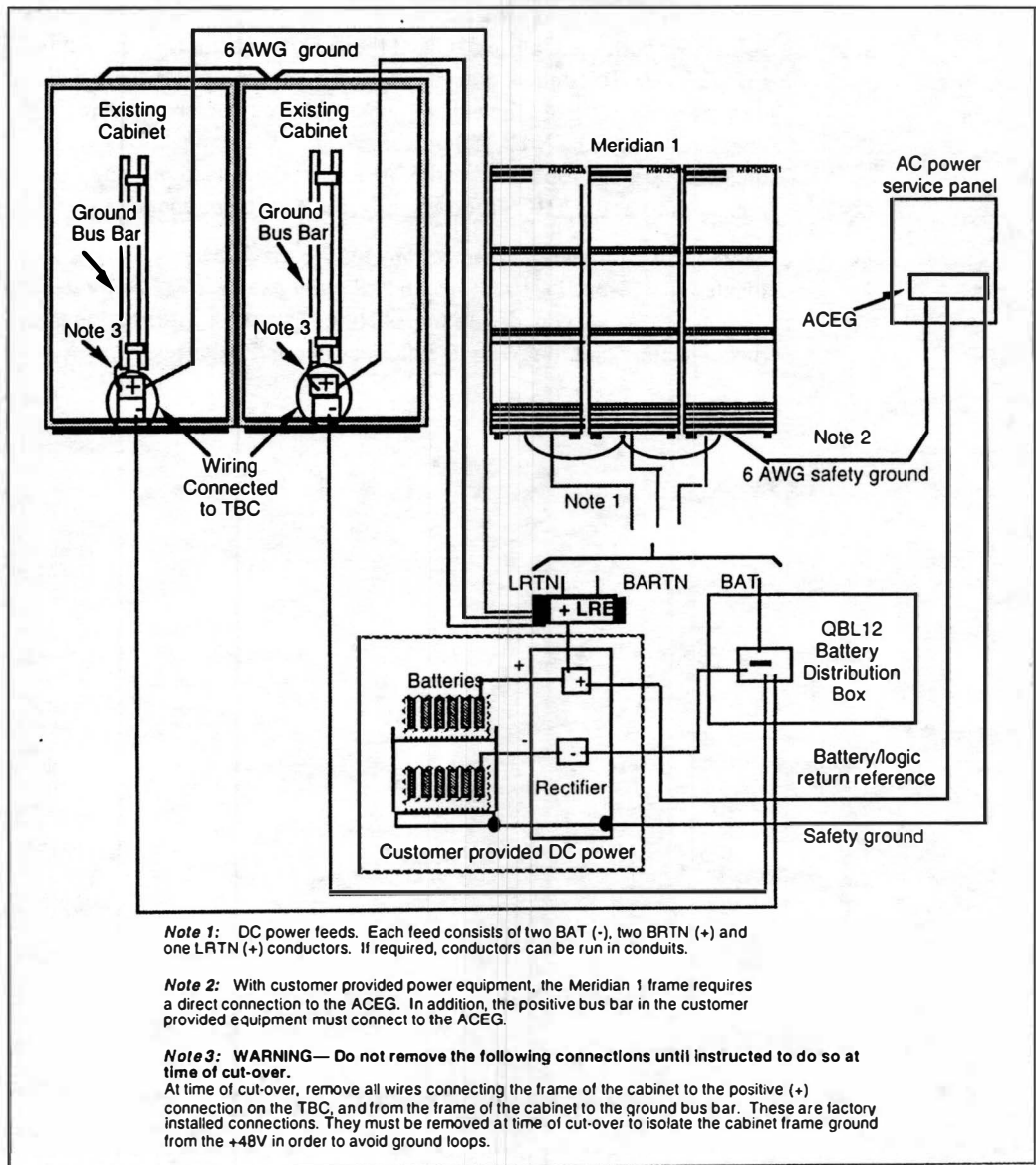
Common power source

Existing cabinet rectifier as a common power source

- When the existing cabinet DC power source is used as a common power source for the cabinet and the column, any QSD4 rectifier will have to be replaced with a QRF8 rectifier and the existing battery distribution box will have to be replaced with a QBL15 battery distribution box. For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 24-5 illustrates a common power supply arrangement for the upgraded system. This includes both Option 51C modules and the existing cabinet. Option 51C consists of a Core Network module and an IPE module. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

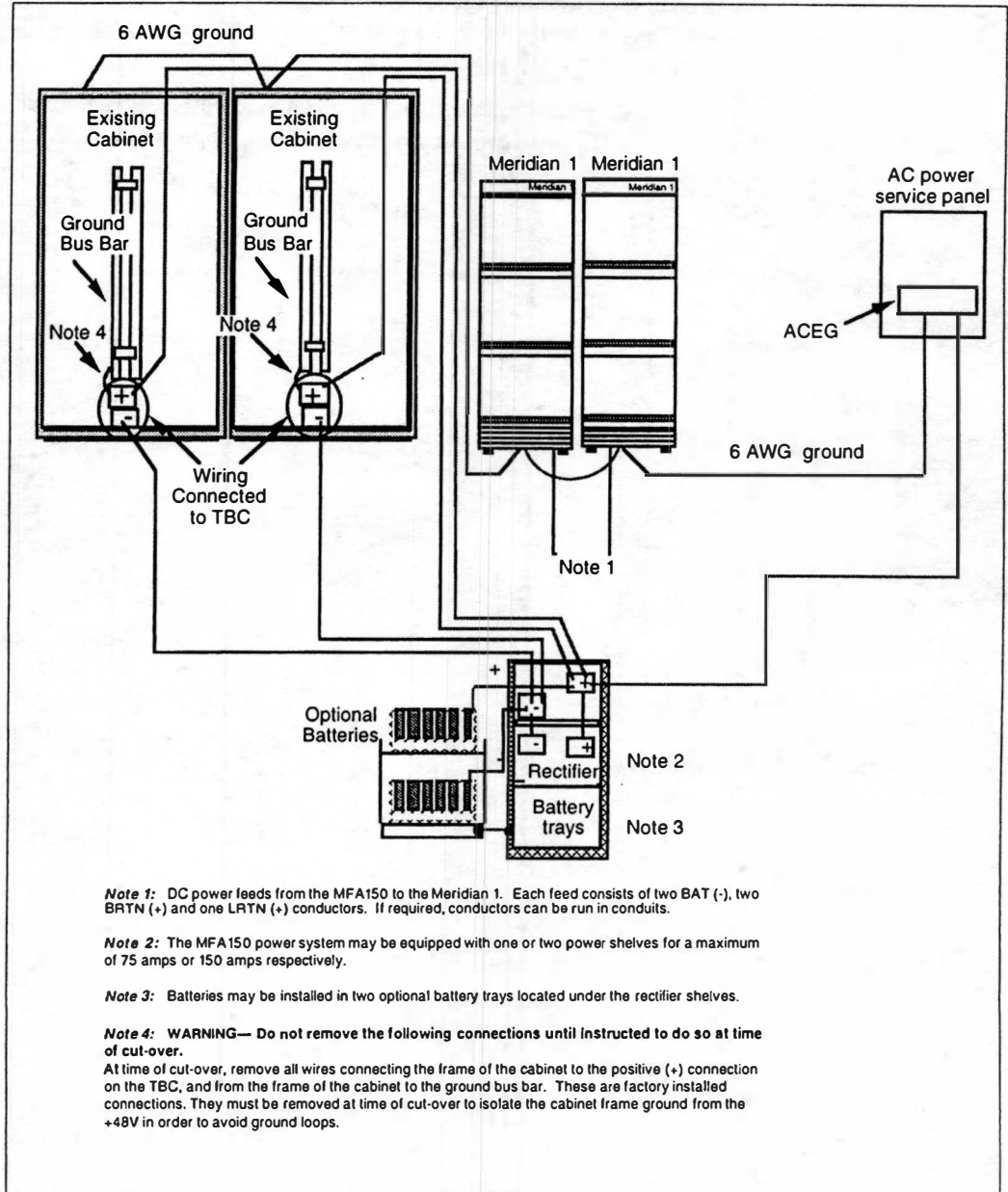
Customer provided power as a common power source

- A QBL12 Battery Distribution Box is normally used to connect to a customer provided DC power source. Figure 24-6 illustrates a customer provided common power supply arrangement for the upgraded system. This includes both Option 51C modules and the existing cabinet. A full description of QBL12 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 24-6**Typical arrangement using a customer provided common DC power supply**

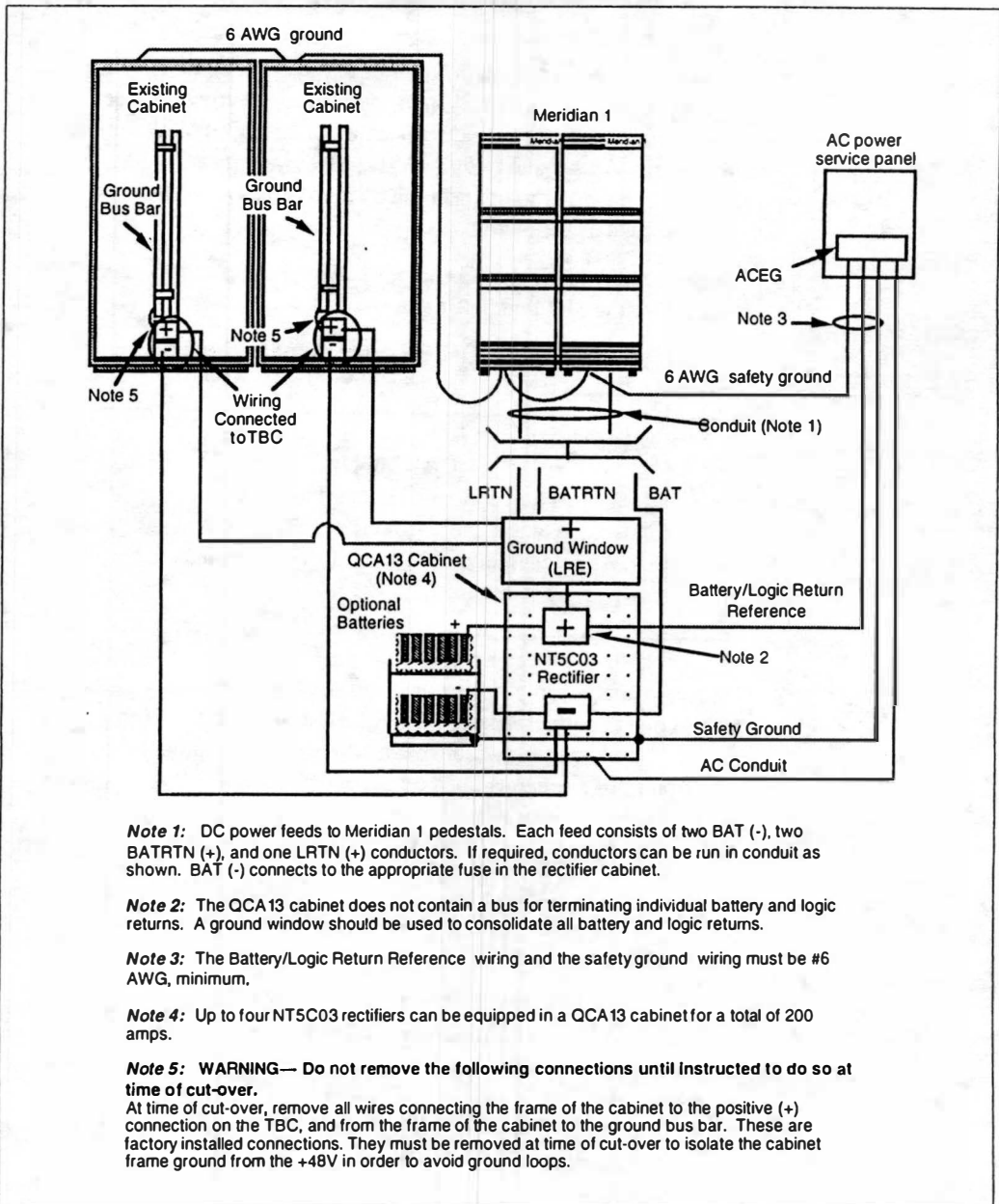
An MFA150 power system as a common power source

- An MFA150 power system assembly can be used as a common power source for both the Option 51C and the existing cabinets as shown in Figure 24-7. To connect the existing cabinets, disconnect the + and - 48V power leads from the existing power source, then reroute and connect them to the MFA150 power system. The connections are located under the top cover of the MFA150 power system. The connections at the TBC of the existing cabinet do not change.
- More information about connections for the MFA150 power system is located in 553-3001-210, *System installation procedures*. Refer to the documentation provided with the existing system for information about disconnecting and removing the old rectifier and batteries.

Figure 24-7**Typical arrangement using an MFA150 power system as a common power source**

An existing QCA13 power cabinet as a common power source

- A QCA13 power cabinet equipped with rectifiers can be used as a common power source for both the Option 21E and the existing cabinets as shown in Figure 24-8.
- For information about connections for the QCA13 power cabinet, refer to 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13.*

Figure 24-8**Typical arrangement using a QCA13 as a common power source**

Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 51C modules.

These cables connect the System Monitor to the SDI Paddle Board in the Core Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section '**Separate power source**' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 24-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 51C system:

- 1 Power up and initially load the Option 51C column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.
 - 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
 - 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
 - 4 The Meridian 1 Option 51C system is now operational.
-

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 51C column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 Connect an NT8D86 cable between the connector on the faceplate of the network card and the I/O panel of the Option 51C. One cable is required for each network loop.
- 2 Connect an NT8D73 shielded cable, up to 30 ft (9 m) in length, to the connector on the I/O panel of the Option 51C. Route the NT8D73 cable to the existing cabinet. Do not connect it to the Peripheral Buffer card in the existing cabinet at this time.

Note: Existing cabinets equipped to suppress EMI may require the installation of filters or connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

- 3 If required in the existing cabinet (see Note) connect an NT8D86 cable to the connector on the NT8D73 shielded cable from the Option 51C. Make sure that the connectors are locked together with the locking devices. Do not connect the cable to the faceplate of the Peripheral Buffer card at this time. It will be connected as part of the cutover procedure.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable.

Cutting-over

The following procedure describes how to cut-over to the Option 51C system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL12 or QCA13 unit**
Remove the fuses from the -48V fuse panel corresponding to each cabinet and column.
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.

Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.

 - **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
- 2 If required, perform power modifications to the existing cabinets.
- 3 In the existing cabinets, remove the wiring connecting the frame of the cabinet to the positive (+) connection of the TBC, and the wiring connecting the frame to the cabinet ground bus bar. Refer to Figures 24-5 through 24-7.

Note: This wiring was factory installed. It must be removed to avoid ground loops when existing cabinets are used with Meridian 1 modules.

- 4 This step applies only to Meridian 1 modules connected to a DC power source.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 24-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
 - the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.
- 5 This step applies only if a new common power source with battery backup connected to a QBL12 or QBL15 battery distribution box is to be used.

Note: This step does not apply if the common power source uses an MFA150 rectifier.

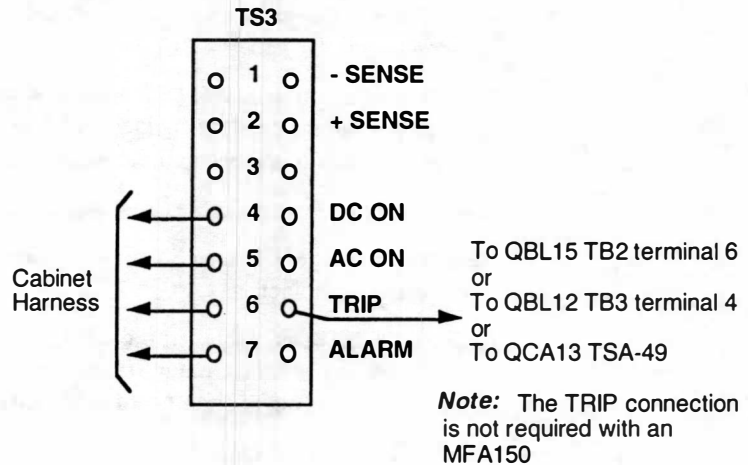
A TRIP lead must be connected to the TRIP connection on:

- the TRIP terminal on the terminal strip on the rectifier in existing cabinets equipped with a rectifier.
- the TRIP terminal of TS3 in existing cabinets not equipped with a rectifier.

The TRIP leads must be connected as follows.

If the existing rectifier is being removed from the cabinet, make the following wiring changes.

- a) If not already connected to TS3, tag and move the cabinet harness DC ON, AC ON, TRIP and ALARM leads presently connected on the rectifier to TS3 as shown in the above drawing. Depending on the type of existing cabinet, the TS3 is located either on the cabinet's TBC block, or on the QUT3 power unit.



- b) Install and connect a 16 AWG wire from terminal 6 (TRIP) on TS3 to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connections in each cabinet with 16 AWG wire.
- c) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.

Note: The DC ON, AC ON and ALARM lead functions are performed by the Meridian 1 module. Leaving these leads connected in the existing cabinets only extends the alarm indicators to the QPC84 power monitors. If you wish, you may leave these leads disconnected. However, the TRIP lead must be connected.

If the existing rectifier is to remain in the cabinet, make the following wiring changes.

- a) Install and connect a 16 AWG wire from the TRIP connection on the terminal strip of the rectifier to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connection on the terminal strip of the rectifier in each cabinet with 16 AWG wire. In existing cabinets not equipped with a rectifier (such as a QCA7 cabinet powered by a QCA8 cabinet), 'daisy chain' to the TRIP connection on TS3.
 - b) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.
- 6 Cross-connect the alarm cables as shown in Figure 24-10.
 - 7 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.
 - 8 Connect the NT8D86 cables (if provided) or NT8D73 shielded network cables from the Option 51C to the connector on the faceplate of the Peripheral Buffer circuit card in the existing cabinets.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable. The NT8D73 shielded cable can be connected directly to the connector of the Peripheral Buffer card.

—OR—

If the existing cabinet is equipped to suppress EMI, the NT8D73 shielded cable should be connected to its assigned filter connector. See 553-3001-150, *Upgrade Engineering* for more information.

- 9 Remove the QPC84 Power Monitor from the QCA58 cabinet and set switch C11, position 2 to ON. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required. Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.

Note: Disregard any remaining alarm indications. Alarm indications should return to normal once the upgrade is completed and equipment that is no longer required has been removed as described later in this chapter.

- 10 Restore power to the cabinets and column by reinserting the removed fuse and resetting all circuit breakers to ON.

CAUTION

Do not remove the NT8D22 system monitor (XSM) from the column while the system is in service. Removing the XSM may cause the input circuit breakers on the existing cabinets to trip.

- 11 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.
-

Figure 24-9
NT8D46 cable types

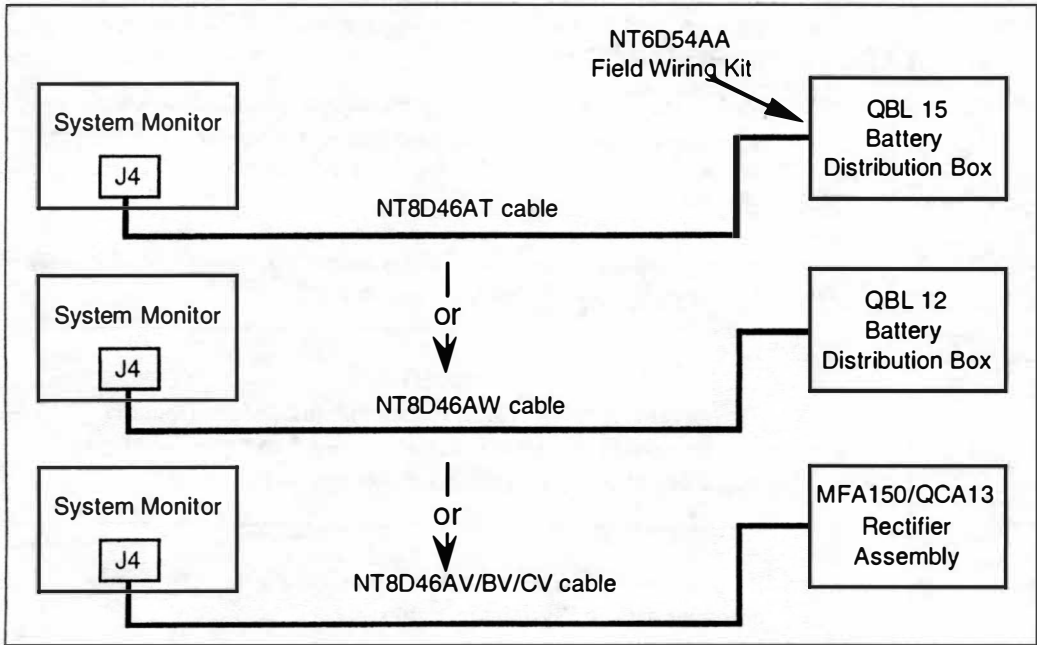
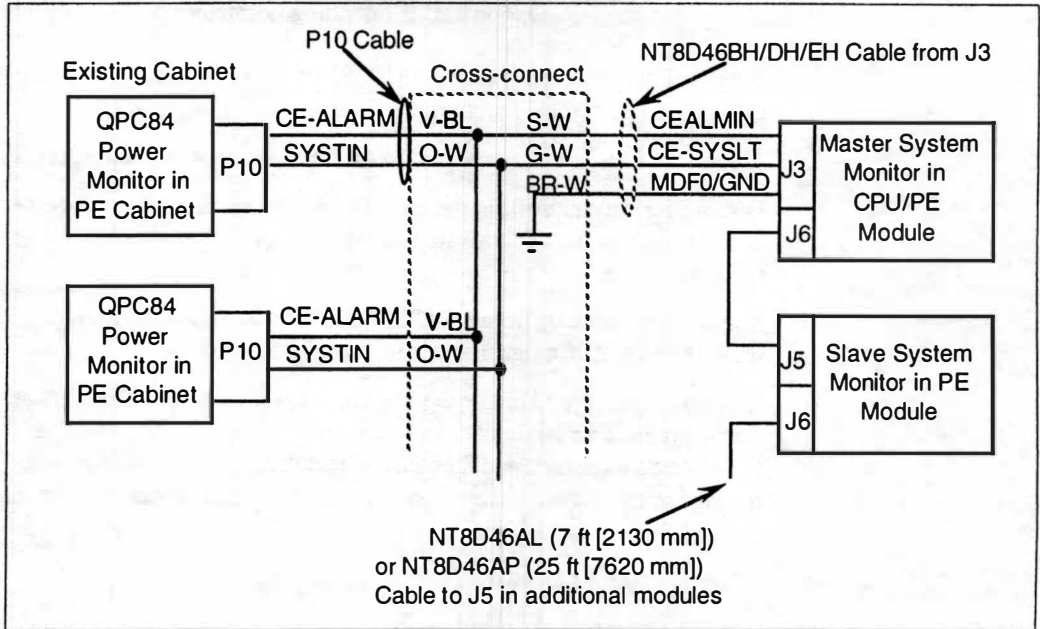


Figure 24-10
Connecting alarm cables between a cabinet and a column



Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

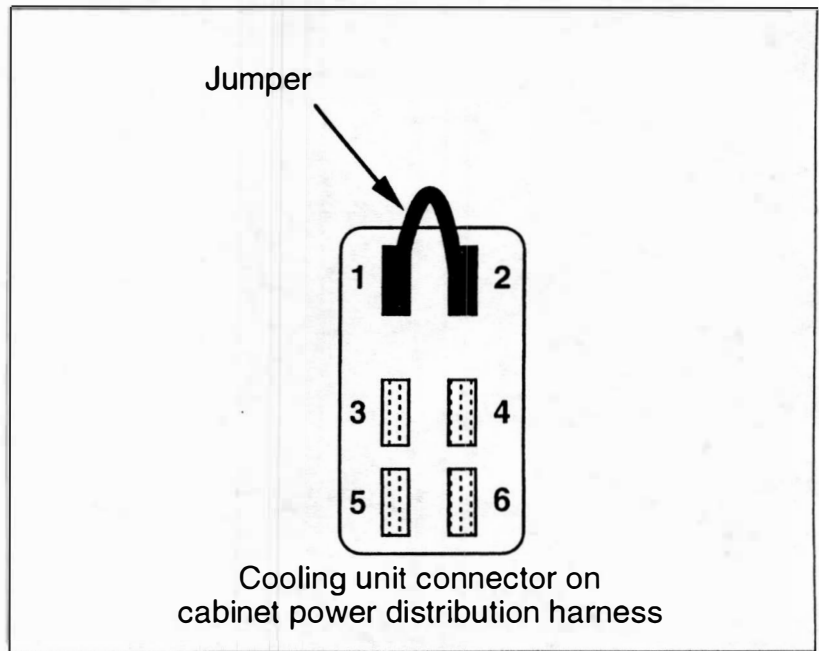
Removing equipment no longer required

The following procedure describes how to remove the equipment that is no longer required once the Option 51C is operating normally.

- 1 Set the circuit breakers for the CPU/MEM and Network shelves in the QCA58 or QCA96 cabinet to OFF.
- 2 Remove the fuse for the tape unit in the QCA58 or QCA96 cabinet.
- 3 Disconnect the cables from the faceplate connectors on all the circuit cards located in the CPU/MEM and Network shelves in the QCA58 or QCA96 cabinet.
- 4 Remove circuit cards from the CE/MEM and Network shelves in the QCA58 or QCA96 cabinet and store them in a safe place.
- 5 Disconnect the Tape Unit or the Mass Storage Unit power monitor and alarm connectors. To do this, you must first remove the Tape Unit or the Mass Storage Unit and then disconnect these connectors. Remove the tape or mass storage unit from the cabinet. Tape all exposed power leads with electrical insulation tape.
- 6 Disconnect power and alarm connections:
 - Disconnect all alarm connectors from the harness to the CPU/MEM shelf.
 - Unplug all power converter cards and all common equipment circuit cards from the CPU/MEM shelf.
 - Remove all CE cards from the Network shelves.
 - Disconnect power connections and the power monitor connector from the cabinet power distribution harness of the backplane on the QSP41 shelf.
 - Tape all exposed power leads with electrical insulation tape.
- 7 If you are using Network shelves for DTI/PRI cards:
 - Install the DTI/PRI cards in Network shelf card slots 2, 4, 6, 8, 10, and 12.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the Core Network module of the option 51C upgrade column to obtain clock reference for the DTI/PRI cards.
 - Set circuit breakers for the Network shelves to ON.

- 8 If you are not going to use Network shelves for DTI/PRI cards:
- Disconnect alarm connectors from the harness to Network shelves.
 - Unplug all power converter cards from each Network shelf.
 - Disconnect power connections and power monitor connector from the cabinet power distribution harness to the backplane on QSD39 and QSD40 shelves.
 - Tape all exposed power leads with electrical insulation tape.
 - Remove shelves.
 - Disconnect and remove the QUD20 cooling unit. Place a jumper (a piece of 24 or 26 AWG bare wire or a paper clip can be used) across power monitor leads 1 and 2 of the cooling unit power connector as shown in Figure 24-11 This disables the alarm for the removed cooling unit.

Figure 24-11
Cooling unit alarm connection



SL-1 QCA60 cabinet upgrade to Meridian 1 Option 51C

This procedure is used to upgrade an SL-1 QCA60 cabinet (S, ST, 21, 21E) to Meridian 1 Option 51C. To upgrade to a Meridian 1 Option 51C system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51C:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51C operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 51C is operating with the new software provided with it.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51C operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Modular upgrade of an SL-1 QCA60 cabinet (S, ST, 21, 21E) to Meridian 1 Option 51C

Equipment required

Table 25-1 lists minimum hardware requirements needed to upgrade to a DC powered Meridian 1 Option 51C system.

Table 25-1

Minimum hardware requirements for a Meridian 1 Option 51C

Quantity			
AC System	DC System	Part number	Description
	1	NT6D41AB	CE Power Supply DC
1	1	NT6D63AA	Input/Output Processor (IO) Pack
1	1	NT6D64AA	Core Multi-Drive Unit (CMDU)
1	1	NT6D65AA	Core Network Interface (CNI) Pack
1	1	NT6D66AA	Call Processor (CP) Pack
1	1	NT6D6003	Core Bus Terminator (CBT) Pack
1		NT7D00AA	Top Cap AC
	1	NT7D00BA RIs 2	Top Cap DC
	1	NT7D09CA	Pedestal DC
	1	NT7D10CA	System Monitor Panel Assembly
	1	NT7D67CA	Power Distribution Unit and filter assembly
1	1	NT8D17AA RIs 9	Conference/TDS Card
1	1	NT8D22AC	System Monitor
1		NT8D27AB RIs 3	Pedestal AC
1		NT8D29AA RIs 4	CE/PE power supply AC
1	1	NT8D41AA RIs 2	2 Port SDI Paddle Board
1	1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	1	NT8D46BH	System Monitor to MDF Cable
-continued-			

Table 25-1 (continued)
Minimum hardware requirements for a Meridian 1 Option 51C

Quantity			
AC System	DC System	Part number	Description
1		NT8D52AA	Pedestal Blower unit AC
	1	NT8D52DC	Pedestal Blower Unit DC
1		NT8D53AB Rls 5	Power Distribution Unit AC
1	1	NT8D84AA	SDI Paddle Board to I/O Cable
	1	NT8D85AZ	CMA to CMA, 5 ft (1520 mm)
1	1	NT8D80AZ	CMA to CMA, 5 ft (1520 mm)
1	1	NT8D93AJ	SDI Paddle Board I/O to DTE/DCE, 16 ft (4875 mm)
1	1	NT8D99AB	Network to Network Module Cable 2 ft (610 mm)
1	1	NT9D11DC	Core Network (CN) Module
1	1	QPC43R	Peripheral Signaling Card
	1	QPC84Q	Power Monitor
1	1	QPC441B Series D	3 Port Extender Card
1	1	QPC477-9A	Bus Terminating Units
1	1	QPC477-10B	Bus Terminating Units

Note: The vintages shown on circuit cards in Table 25-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA60 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 51C Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 51C to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 51C to the existing cabinet.
- A second NT8D86 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Note: The second NT8D86 cable is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as a QCA7 or 8) do not require the second NT8D86 cable since the NT8D73 cable can be connected directly to the Peripheral Buffer connector. For existing cabinets equipped to suppress EMI, refer to 553-3001-150, *Upgrade Engineering*.

Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 51C system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 25-1 shows a typical QCA60 cabinet and Figure 25-2 shows a QCA60 cabinet that has been upgraded to Meridian 1 Option 51C.

Figure 25-1
Typical QCA60 cabinet

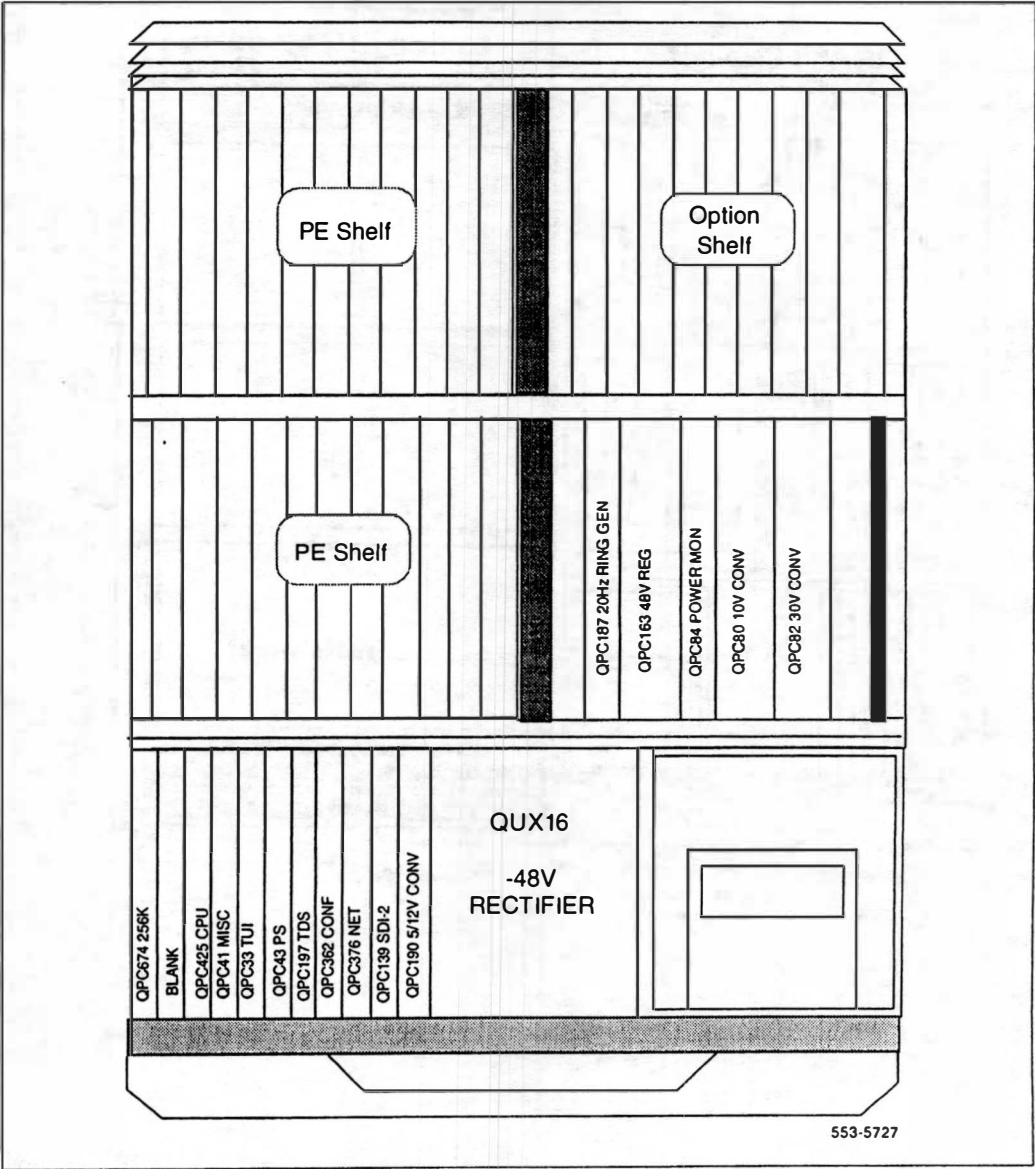
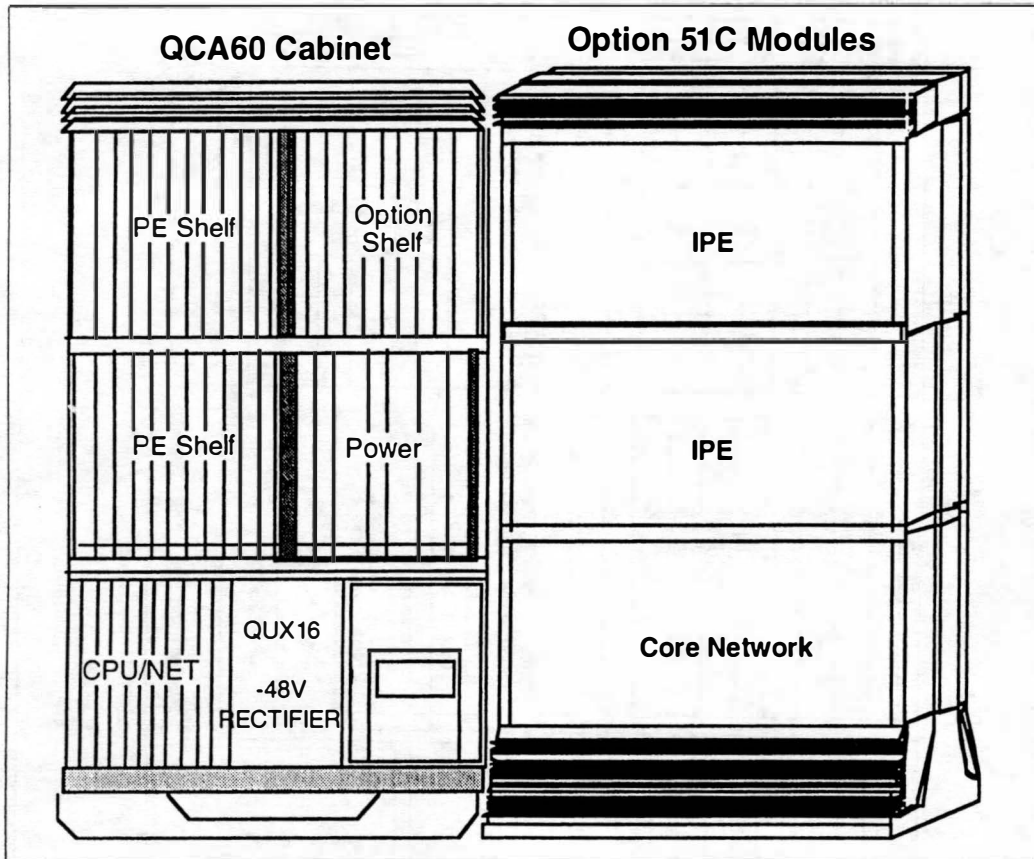


Figure 25-2

Typical QCA60 cabinet that has been upgraded to Meridian 1 Option 51C



Installing the Meridian 1 Option 51C system

The Option 51C equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, Core Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 51C equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 25-2 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.

- Install cabling:
 - Cable common equipment
 - Cable network loops (within the Option 51C columns only).
- Note:* Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.
- Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 51C equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 25-3 shows Option 51C circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 25-2**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 25-2 (continued)

NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 25-2 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves				Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."					
For each slave, indicates the slave address				Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."					
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master		on						
	slave		off						
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

Table 25-2 (continued)

NT8D22 system monitor — settings for total number of slaves — SW2 on master

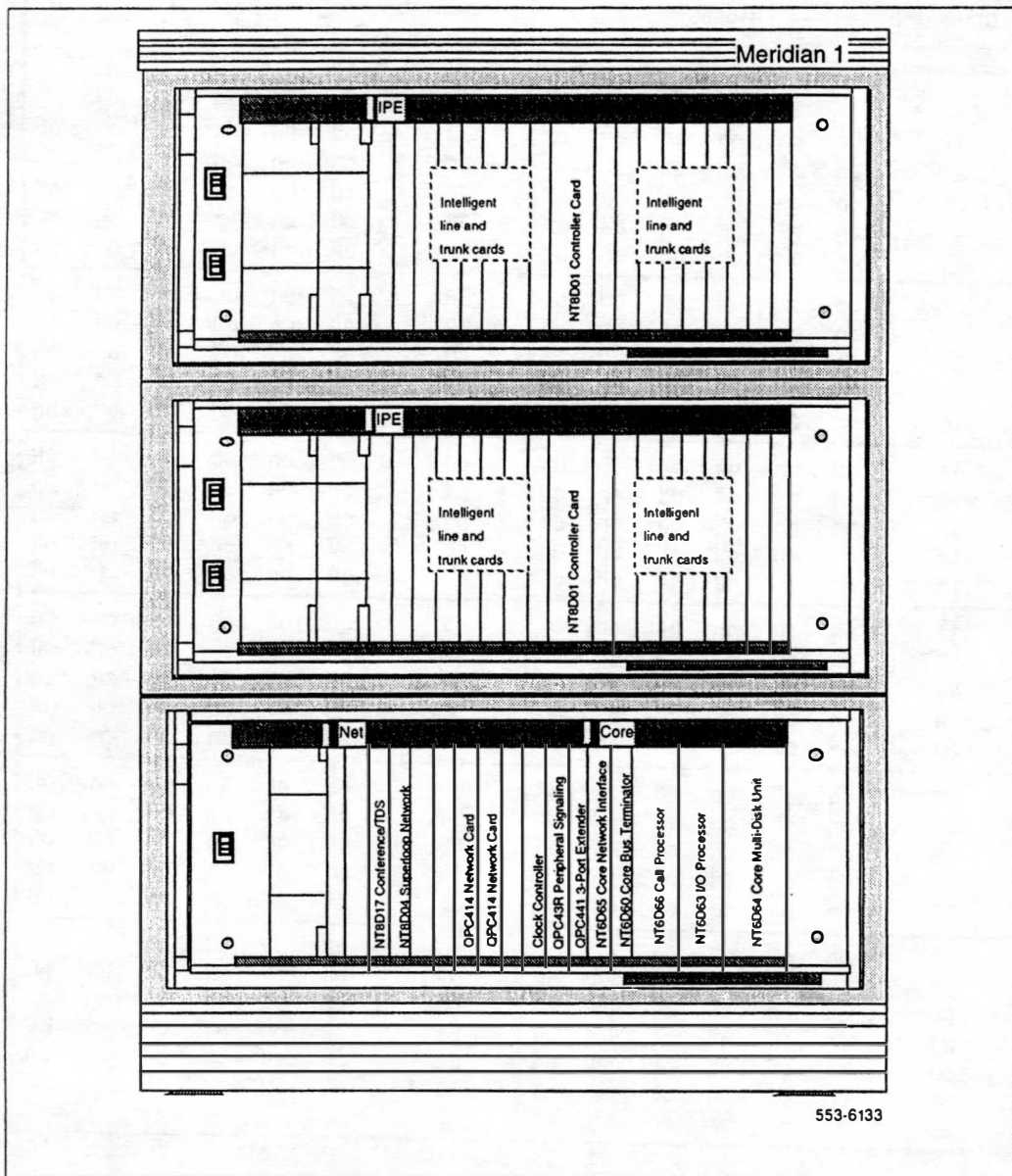
How many slave units	Switch position						How many slave units	Switch position					
	3	4	5	6	7	8		3	4	5	6	7	8
0	on	on	on	on	on	on	32	off	on	on	on	on	on
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
— continued —													

Table 25-2 (continued)

NT8D22 system monitor — slave address — SW2 on slave

Slave unit address		Position						Slave unit address		Position					
		3	4	5	6	7	8			3	4	5	6	7	8
1		on	on	on	on	on	off	33		off	on	on	on	on	off
2		on	on	on	on	off	on	34		off	on	on	on	off	on
3		on	on	on	on	off	off	35		off	on	on	on	off	off
4		on	on	on	off	on	on	36		off	on	on	off	on	on
5		on	on	on	off	on	off	37		off	on	on	off	on	off
6		on	on	on	off	off	on	38		off	on	on	off	off	on
7		on	on	on	off	off	off	39		off	on	on	off	off	off
8		on	on	off	on	on	on	40		off	on	off	on	on	on
9		on	on	off	on	on	off	41		off	on	off	on	on	off
10		on	on	off	on	off	on	42		off	on	off	on	off	on
11		on	on	off	on	off	off	43		off	on	off	on	off	off
12		on	on	off	off	on	on	44		off	on	off	off	on	on
13		on	on	off	off	on	off	45		off	on	off	off	on	off
14		on	on	off	off	off	on	46		off	on	off	off	off	on
15		on	on	off	off	off	off	47		off	on	off	off	off	off
16		on	off	on	on	on	on	48		off	off	on	on	on	on
17		on	off	on	on	on	off	49		off	off	on	on	on	off
18		on	off	on	on	off	on	50		off	off	on	on	off	on
19		on	off	on	on	off	off	51		off	off	on	on	off	off
20		on	off	on	off	on	on	52		off	off	on	off	on	on
21		on	off	on	off	on	off	53		off	off	on	off	on	off
22		on	off	on	off	off	on	54		off	off	on	off	off	on
23		on	off	on	off	off	off	55		off	off	on	off	off	off
24		on	off	off	on	on	on	56		off	off	off	on	on	on
25		on	off	off	on	on	off	57		off	off	off	on	on	off
26		on	off	off	on	off	on	58		off	off	off	on	off	on
27		on	off	off	on	off	off	59		off	off	off	on	off	off
28		on	off	off	off	on	on	60		off	off	off	off	on	on
29		on	off	off	off	on	off	61		off	off	off	off	on	off
30		on	off	off	off	off	on	62		off	off	off	off	off	on
31		on	off	off	off	off	off	63		off	off	off	off	off	off
32		off	on	on	on	on	on								

Figure 25-3
Meridian 1 Option 51C Core Network and IPE modules



Connecting system ground and power Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 51C: one that is designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 51C, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

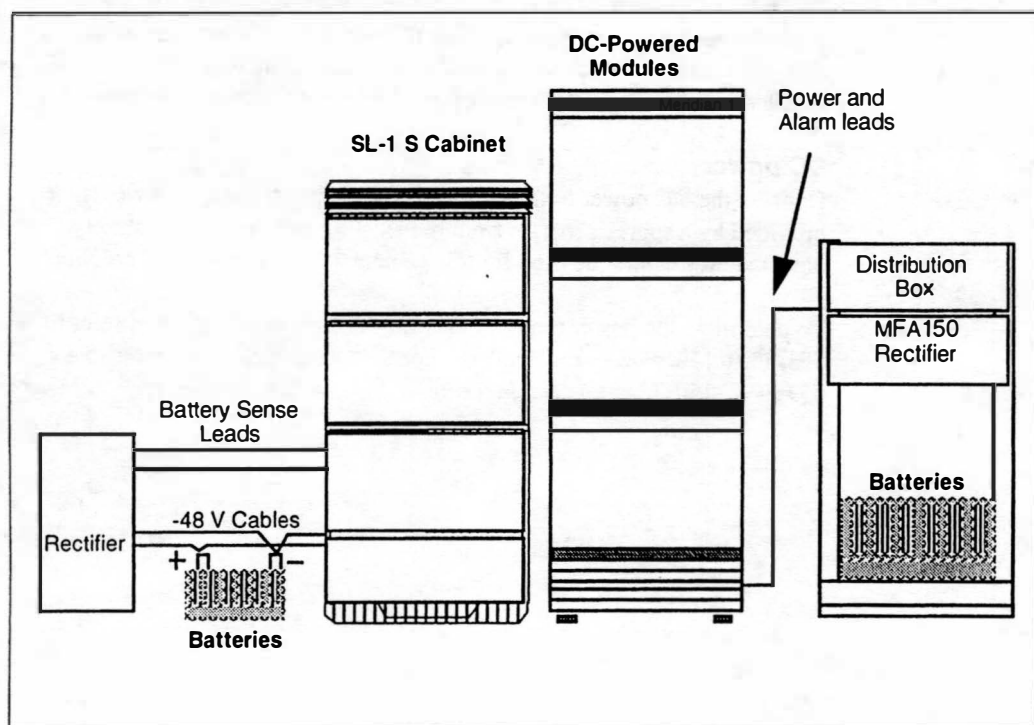
DC power

Connect the DC power to the Option 51C columns. The DC power is provided by a source separate from the existing cabinets. A common power source cannot be used for this cabinet and an Option 51C column.

To determine the power requirements for the Option 51C system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 25-4 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 51C modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 51C column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 25-4**Typical arrangement of independently DC-powered Meridian 1 Option 51C modules**

Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 51C modules.

These cables connect the System Monitor to the SDI Paddle Board in the Core Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH /DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

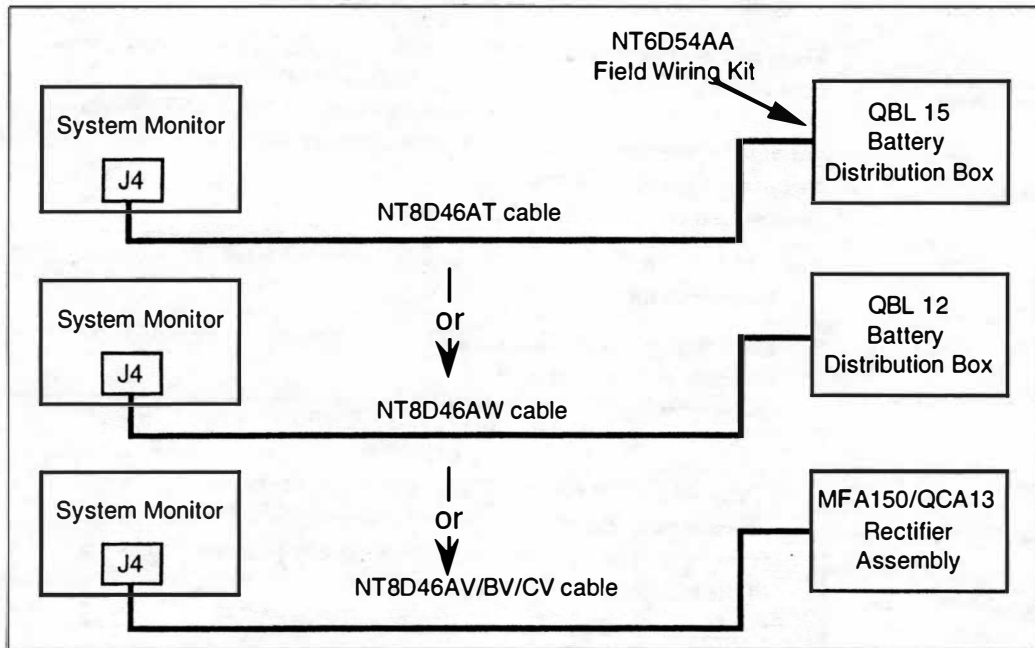
To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section '**Separate power source**' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 25-5) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Figure 25-5
NT8D46 cable types



Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 51C system:

- 1 Power up and initially load the Option 51C column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.
 - 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
 - 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
 - 4 The Meridian 1 Option 51C system is now operational.
-

Preparing external network cables

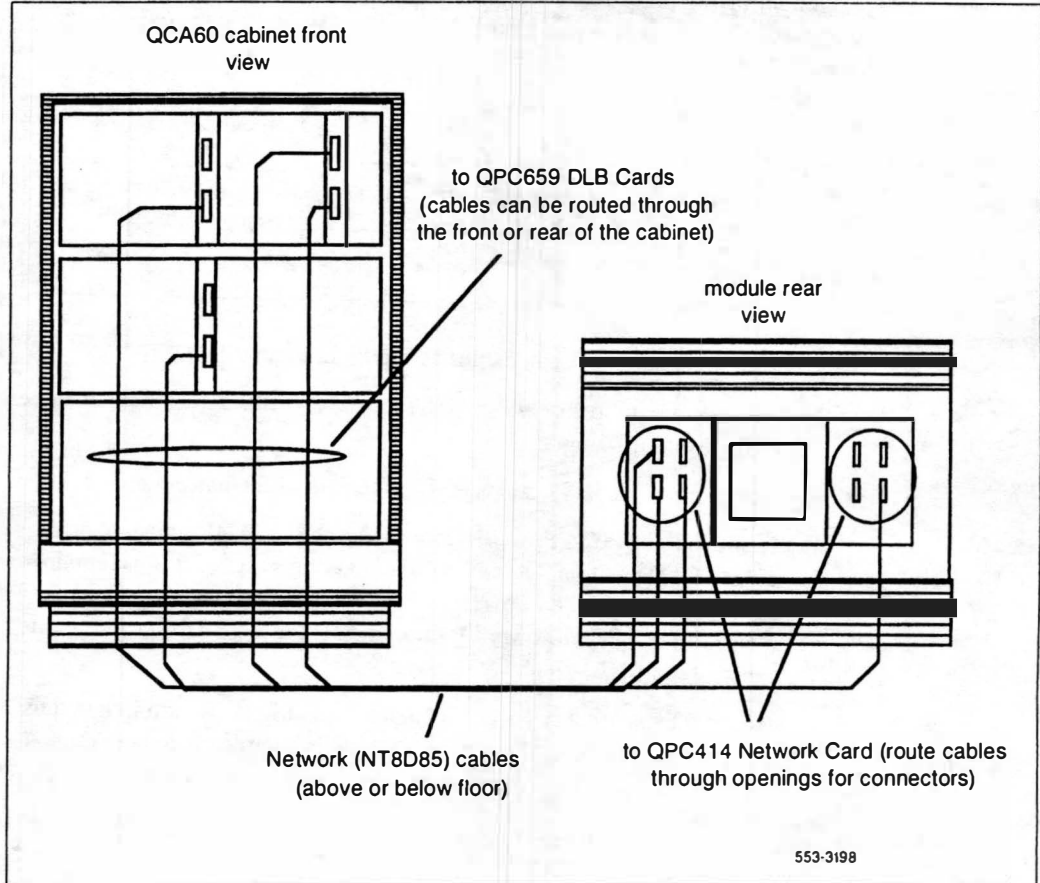
Prepare network cables between the existing cabinet and the Option 51C column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 Remove the rear covers from the QCA60 cabinet. See Figure 25-6 for cable routing.
 - 3 Layout a NT8DD85 cable between the QPC414 Network Card and the DLB card.
 - 4 Reinstall the covers on the QCA60 cabinet.
-

Figure 25-6**Cable types and their routing (non-EMI suppression applications)**

Cutting-over

The following procedure describes how to cut-over to the Option 51C system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Cross-connect the alarm cables as shown in Figure 25-7.
- 2 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.
- 3 Connect the NT8D85 cables to the faceplate of the buffer cards.
- 4 Remove the QPC84 Power Monitor from the QCA60 cabinet and set switch C11, position 2 to ON. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required. Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.

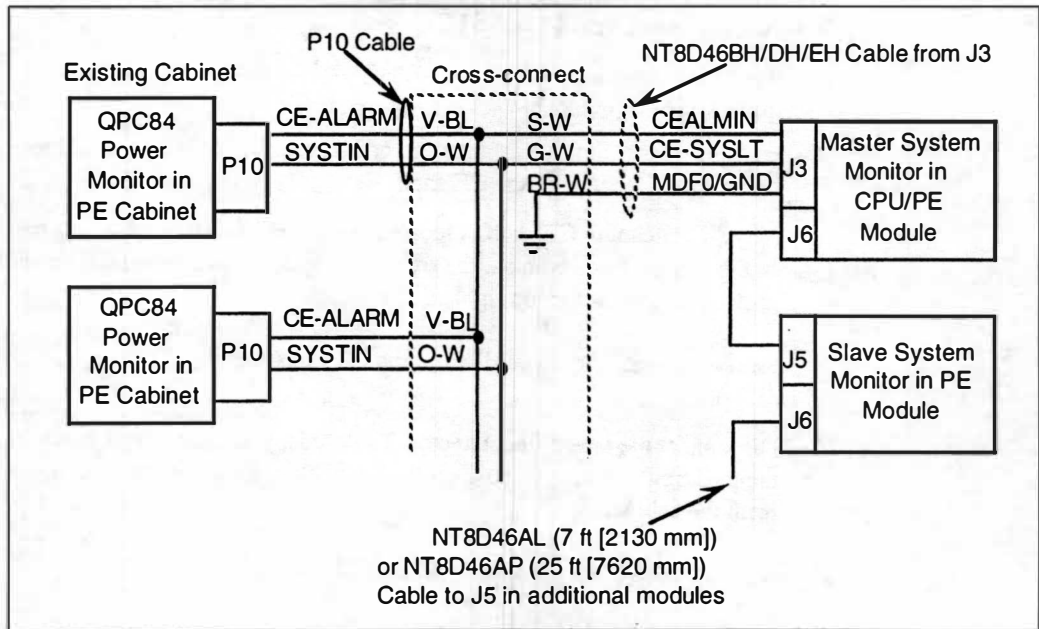
Note: Disregard any remaining alarm indications. Alarm indications should return to normal once the upgrade is completed and equipment that is no longer required has been removed as described later in this chapter.

CAUTION

Do not remove the NT8D22 system monitor (XSM) from the column while the system is in service. Removing the XSM may cause the input circuit breakers on the existing cabinets to trip.

- 5 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Figure 25-7
Connecting alarm cables between a cabinet and a column



Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

Removing equipment no longer required

The following procedure describes how to remove the equipment that is no longer required once the Option 51C is operating normally.

- 1 Set the CE shelf circuit breaker labeled CB1 on the power control shelf in the QCA60 cabinet to OFF.
- 2 Disconnect and remove cables from connectors on the faceplate of the circuit cards located on the CE shelf.

Note: The main CE shelf is located at the bottom left shelf position in the cabinet (viewed from the front). An optional expansion CE shelf may be located at the top right shelf position.

- 3 Remove the CE circuit cards from the CE shelf and store them in a safe place.
 - 4 Disconnect the tape unit connector. To do this, you must first remove the tape unit and then disconnect the connector. Remove the tape unit from the cabinet.
 - 5 If you are using the CE shelf for DTI/PRI cards:
 - Install the DTI/PRI cards.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the Core Network module of the option 51C upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breaker for the CE shelf on the power control shelf to ON.
 - 6 If you are not going to use the CE shelf for DTI/PRI cards unplug and remove the remaining cards from the CE shelf.
-

SL-1 QCA109 cabinet upgrade to Meridian 1 Option 51C

This procedure is used to upgrade an SL-1 QCA109 cabinet (MS, ST, 21 or 21E) to a Meridian 1 Option 51C. To upgrade to a Meridian 1 Option 51C system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51C:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51C operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 51C is operating with the new software provided with it.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51C operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Modular upgrade of an SL-1 QCA109 cabinet (MS, ST, 21 or 21E) to Meridian 1 Option 51C

Equipment required

Table 26-1 lists minimum hardware requirements needed to upgrade an SL-1 MS system to a DC powered Meridian 1 Option 51C system.

Table 26-1

Minimum hardware requirements for a Meridian 1 Option 51C

Quantity			
AC System	DC System	Part number	Description
	1	NT6D41AB	CE Power Supply DC
1	1	NT6D63AA	Input/Output Processor (IO) Pack
1	1	NT6D64AA	Core Multi-Drive Unit (CMDU)
1	1	NT6D65AA	Core Network Interface (CNI) Pack
1	1	NT6D66AA	Call Processor (CP) Pack
1	1	NT6D6003	Core Bus Terminator (CBT) Pack
1		NT7D00AA	Top Cap AC
	1	NT7D00BA Rls 2	Top Cap DC
	1	NT7D09CA	Pedestal DC
	1	NT7D10CA	System Monitor Panel Assembly
	1	NT7D67CA	Power Distribution Unit and filter assembly
1	1	NT8D17AA Rls 9	Conference/TDS Card
1	1	NT8D22AC	System Monitor
1		NT8D27AB Rls 3	Pedestal AC
1		NT8D29AA Rls 4	CE/PE power supply AC
1	1	NT8D41AA Rls 2	2 Port SDI Paddle Board
1	1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	1	NT8D46BH	System Monitor to MDF Cable
-continued-			

Table 26-1 (continued)
Minimum hardware requirements for a Meridian 1 Option 51C

Quantity			
AC System	DC System	Part number	Description
1		NT8D52AA	Pedestal Blower unit AC
	1	NT8D52DC	Pedestal Blower Unit DC
1		NT8D53AB Rls 5	Power Distribution Unit AC
1	1	NT8D84AA	SDI Paddle Board to I/O Cable
	1	NT8D85AZ	CMA to CMA, 5 ft (1520 mm)
1	1	NT8D80AZ	CMA to CMA, 5 ft (1520 mm)
1	1	NT8D93AJ	SDI Paddle Board I/O to DTE/DCE, 16 ft (4875 mm)
1	1	NT8D99AB	Network to Network Module Cable 2 ft (610 mm)
1	1	NT9D11DC	Core Network (CN) Module
1	1	QPC43R	Peripheral Signaling Card
	1	QPC84Q	Power Monitor
1	1	QPC441B Series D	3 Port Extender Card
1	1	QPC477-9A	Bus Terminating Units
1	1	QPC477-10B	Bus Terminating Units

Note: The vintages shown on circuit cards in Table 26-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA109 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 51C Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 51C to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 51C to the existing cabinet.
- A second NT8D86 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Note: The second NT8D86 cable is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as a QCA7 or 8) do not require the second NT8D86 cable since the NT8D73 cable can be connected directly to the Peripheral Buffer connector. For existing cabinets equipped to suppress EMI, refer to 553-3001-150, *Upgrade Engineering*.

Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 51C system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 26-1 shows a typical QCA109 cabinet and Figure 26-2 shows a QCA109 cabinet that has been upgraded to Meridian 1 Option 51C.

Figure 26-1
Typical QCA109 cabinet

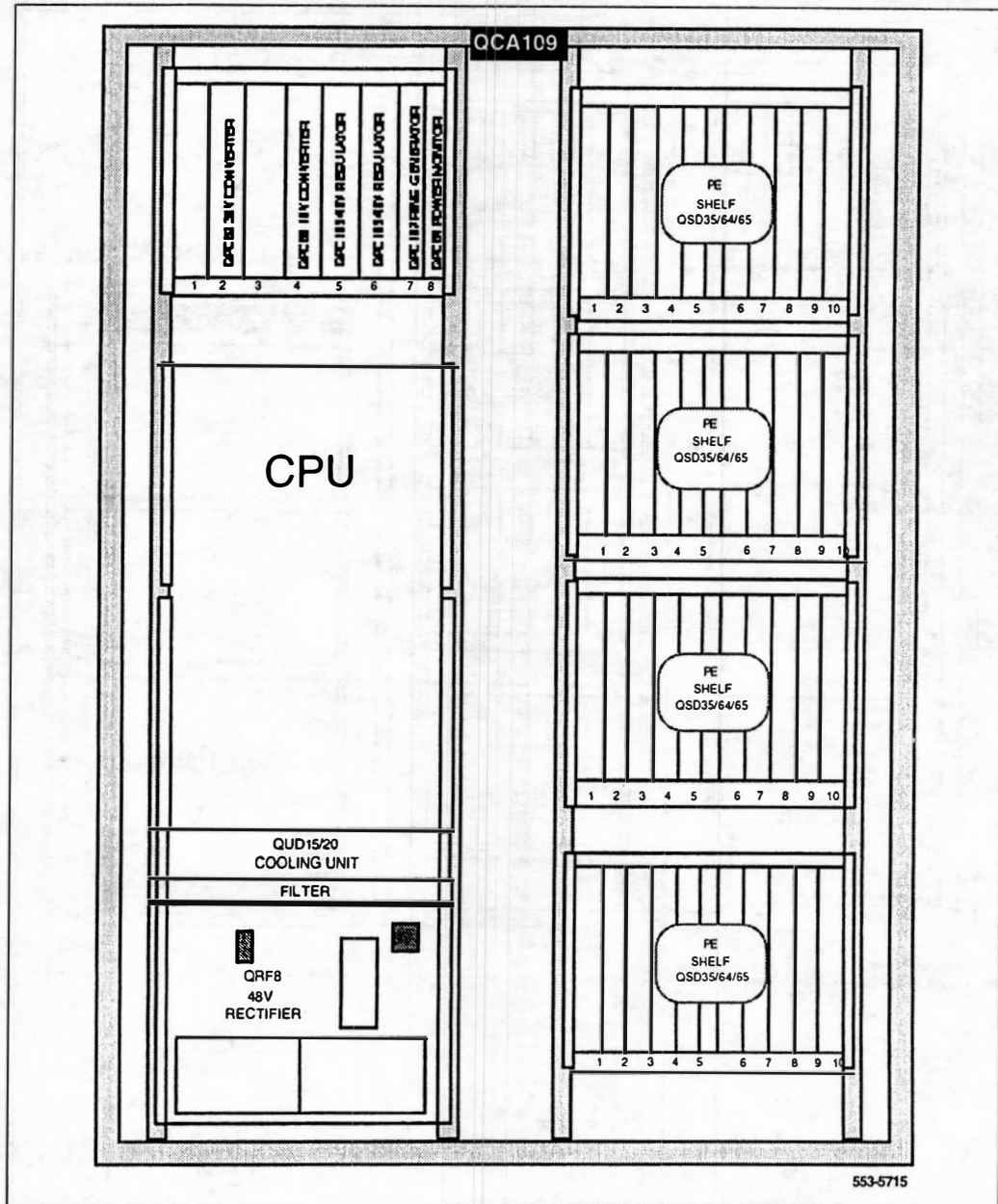
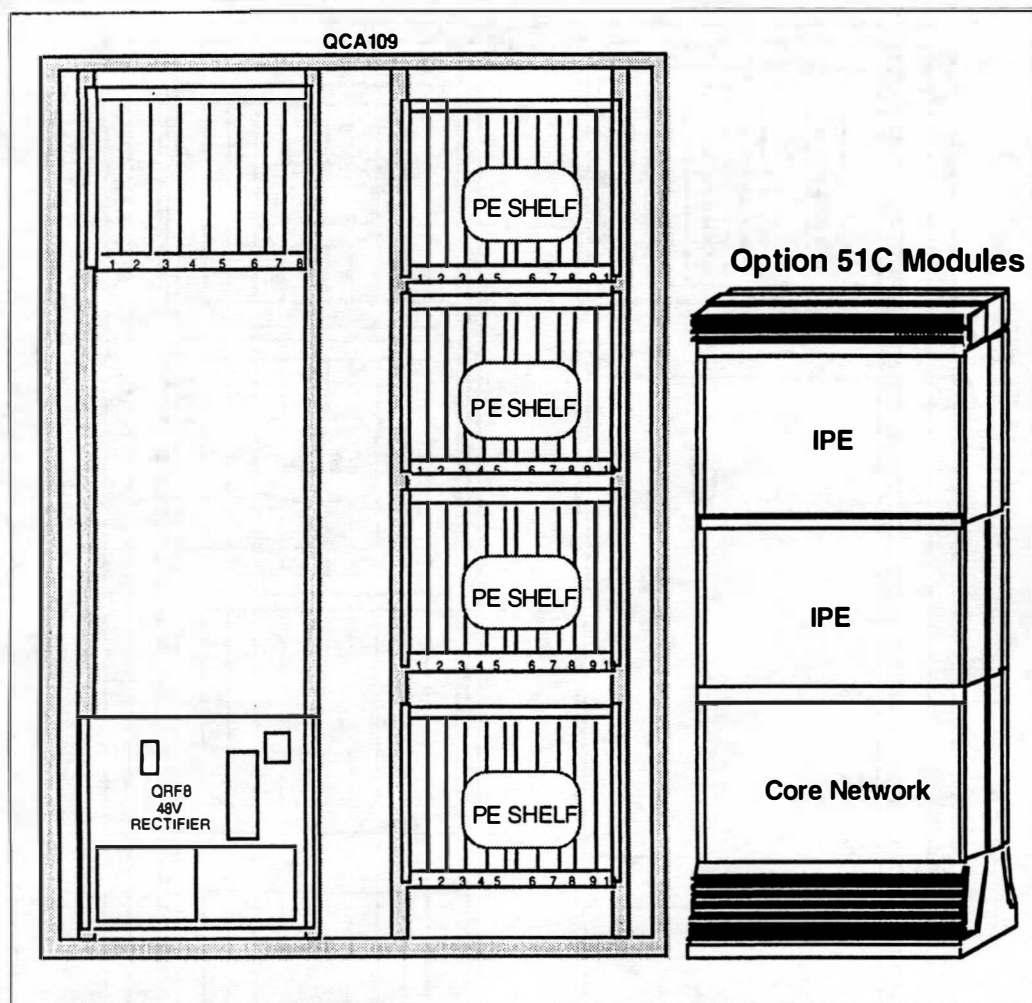


Figure 26-2

Typical QCA109 cabinet that has been upgraded to Meridian 1 Option 51C



Installing the Meridian 1 Option 51C system

The Option 51C equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, Core Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 51C equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 26-2 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port:
- Install cabling:

- Cable common equipment
- Cable network loops (within the Option 51C columns only).

Note: Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.

- Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 51C equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 26-3 shows Option 51C circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 26-2

NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 26-2 (continued)**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 26-2 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves		Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."							
For each slave, indicates the slave address		Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."							
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master		on						
	slave		off						
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

Table 26-2 (continued)

NT8D22 system monitor — settings for total number of slaves — SW2 on master

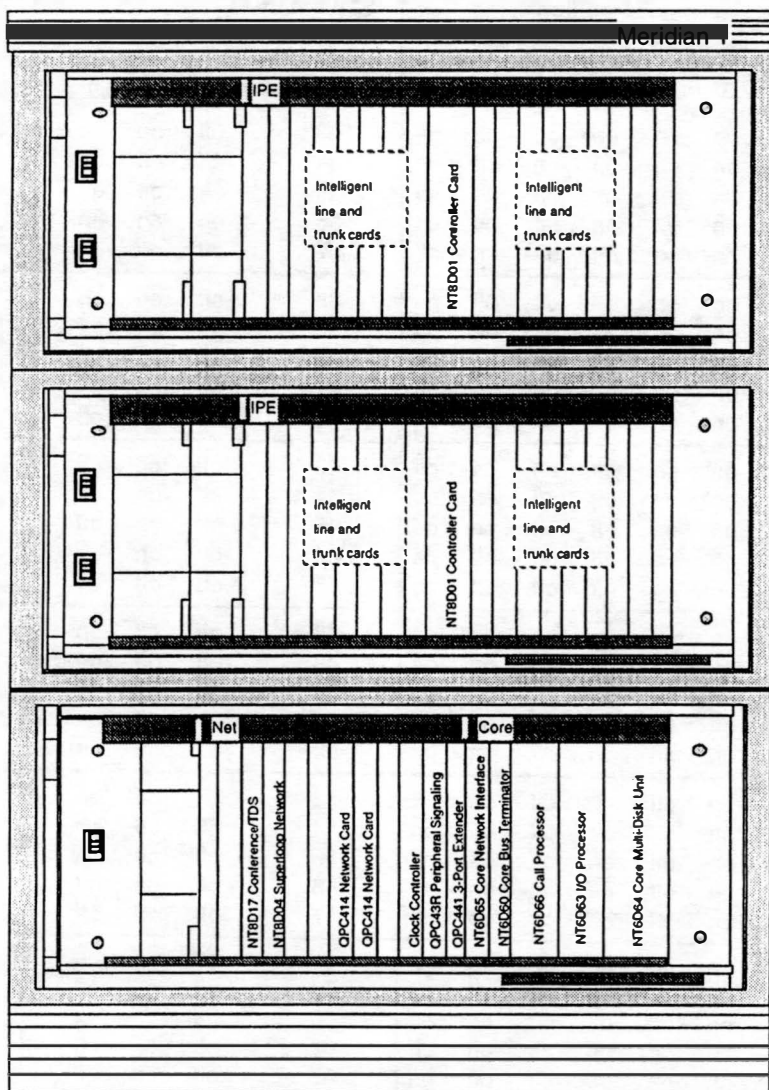
How many slave units	Switch position						How many slave units	Switch position					
	3	4	5	6	7	8		3	4	5	6	7	8
0	on	on	on	on	on	on	32	off	on	on	on	on	on
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
— continued —													

Table 26-2 (continued)

NT8D22 system monitor — slave address — SW2 on slave

Slave unit address							Position							Slave unit address							Position						
	3	4	5	6	7	8		3	4	5	6	7	8		3	4	5	6	7	8		3	4	5	6	7	8
1	on	on	on	on	on	off	33	off	on	on	on	on	off	33	off	on	on	on	on	off	33	off	on	on	on	off	on
2	on	on	on	on	on	off	34	off	on	on	on	on	off	34	off	on	on	on	on	off	34	off	on	on	on	off	on
3	on	on	on	on	on	off	35	off	on	on	on	on	off	35	off	on	on	on	on	off	35	off	on	on	on	off	on
4	on	on	on	off	on	on	36	off	on	on	on	off	on	36	off	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off	37	off	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on	38	off	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off	39	off	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on	40	off	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off	41	off	on	off	on	on	on	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on	42	off	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off	43	off	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on	44	off	on	off	off	on	on	44	off	on	off	on	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off	45	off	on	off	off	on	off	45	off	on	off	on	off	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on	46	off	on	off	off	off	on	46	off	on	off	off	on	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off	47	off	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on	48	off	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off	49	off	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on	50	off	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off	51	off	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on	52	off	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off	53	off	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on	54	off	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off	55	off	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on	56	off	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off	57	off	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on	58	off	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off	59	off	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on	60	off	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off	61	off	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on	62	off	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off	63	off	off	off	off	off	off	63	off	off	off	off	off	off
32	off	on	on	on	on	on																					

Figure 26-3
Meridian 1 Option 51C Core Network and IPE modules



553-6133

Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 51C: one designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 51C, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Note: Depending on the power configuration used it may be required to do modifications to the existing cabinets. If modifications are required, do them as part of the cut-over procedures (described later in this document) to avoid unnecessary interruption of service to the end users.

Connect the DC power to the Option 51C columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

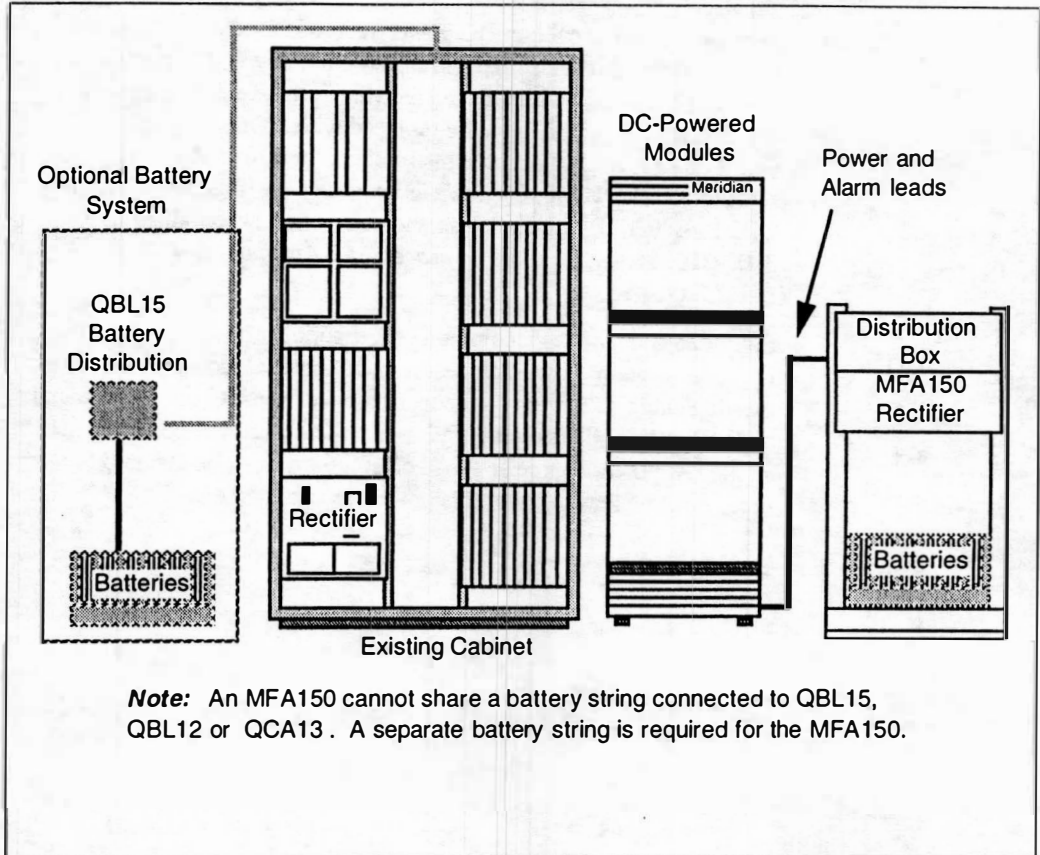
- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 51C equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 51C module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 51C modules.

- a new power source installed in conjunction with the Option 51C.

To determine the power requirements for the Option 51C system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

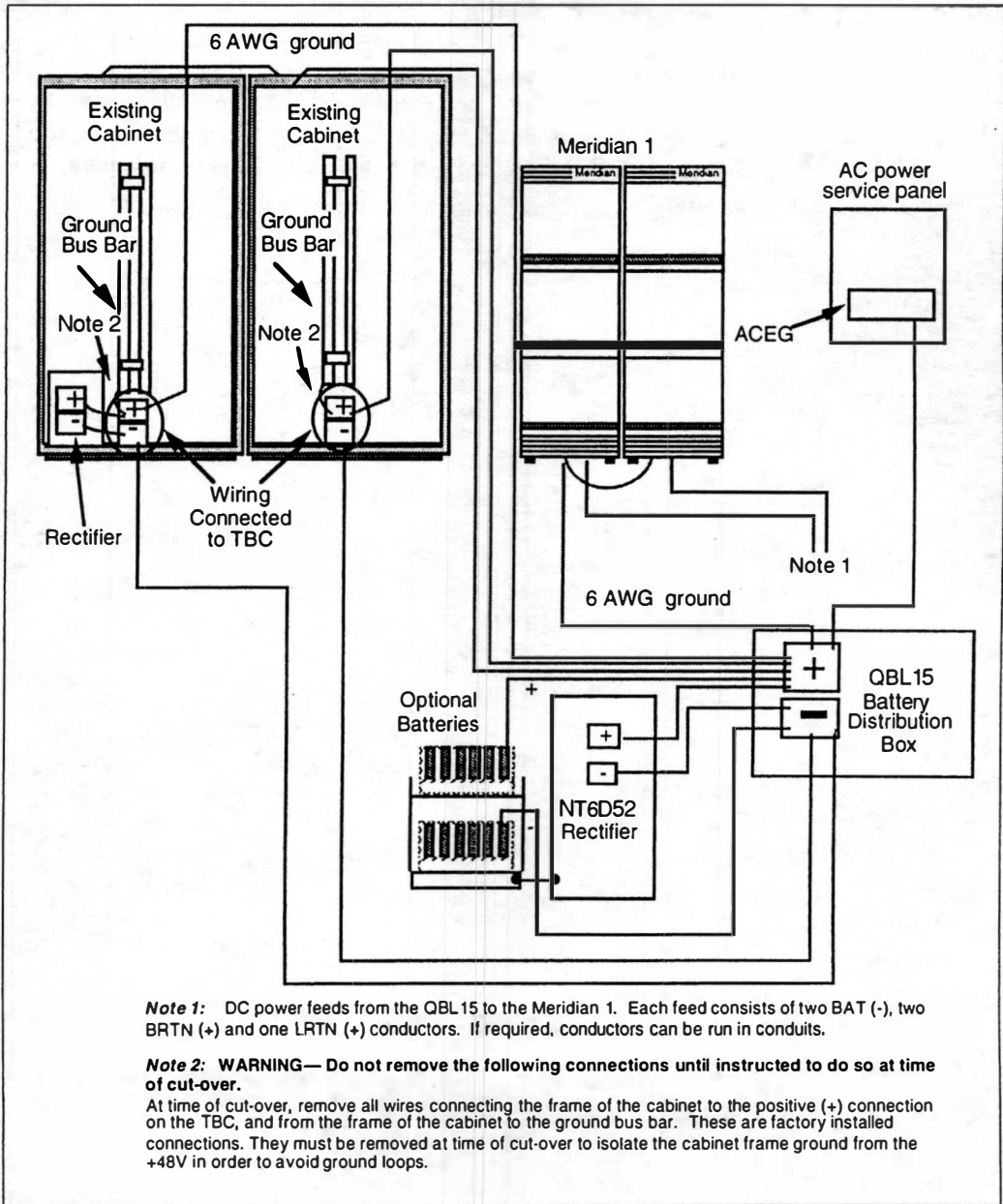
Figure 26-4 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 51C modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 51C column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 26-4**Typical arrangement of independently DC-powered Meridian 1 Option 51C modules**

Common power source

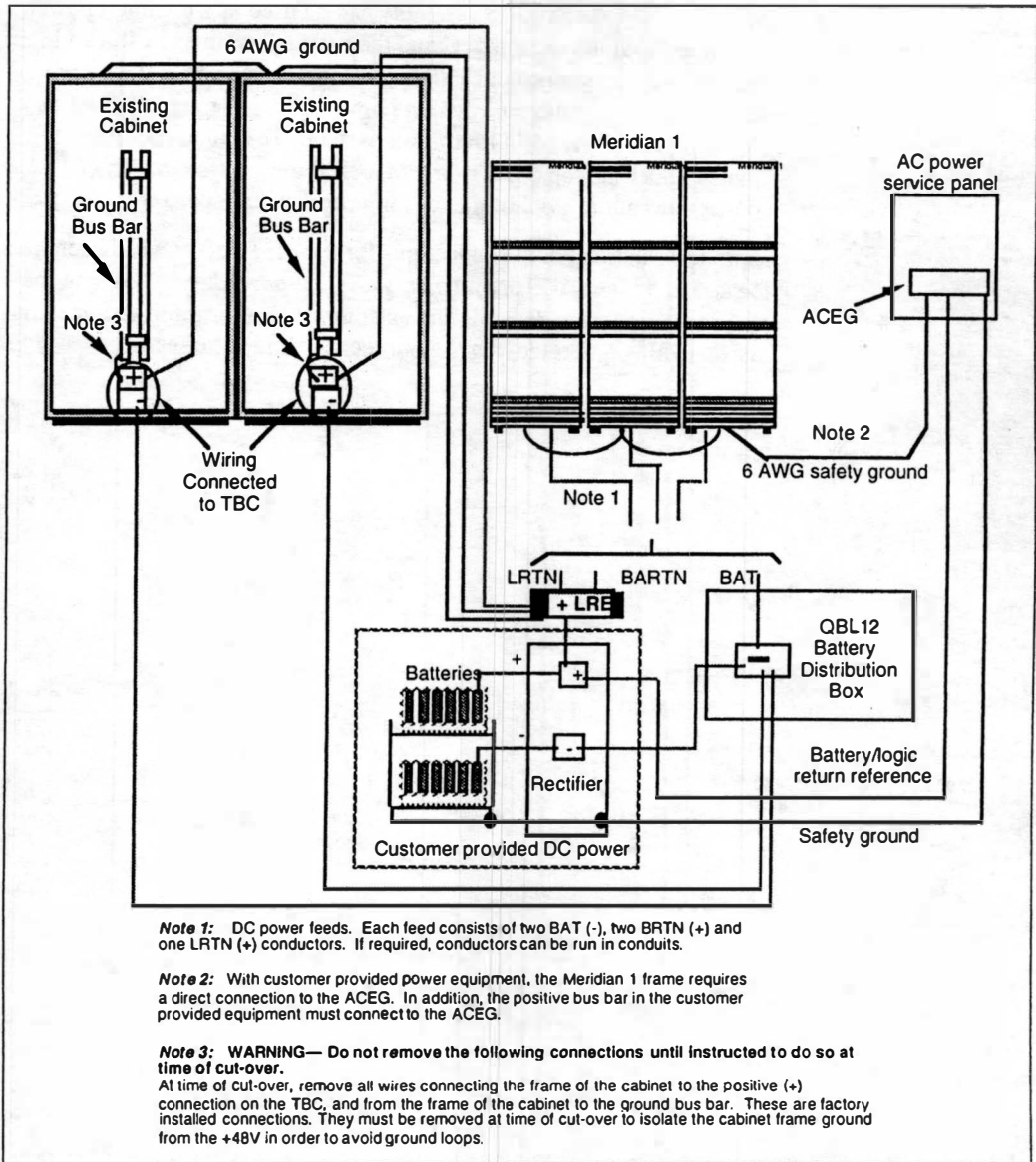
Existing cabinet rectifier as a common power source

- When the existing cabinet DC power source is used as a common power source for the cabinet and the column, any QSD4 rectifier will have to be replaced with a QRF8 rectifier and the existing battery distribution box will have to be replaced with a QBL15 battery distribution box. For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 26-5 illustrates a common power supply arrangement for the upgraded system. This includes both Option 51C modules and the existing cabinet. Option 51C consists of a Core Network module and an IPE module. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

Figure 26-5**Typical arrangement using a common DC power supply with optional battery backup**

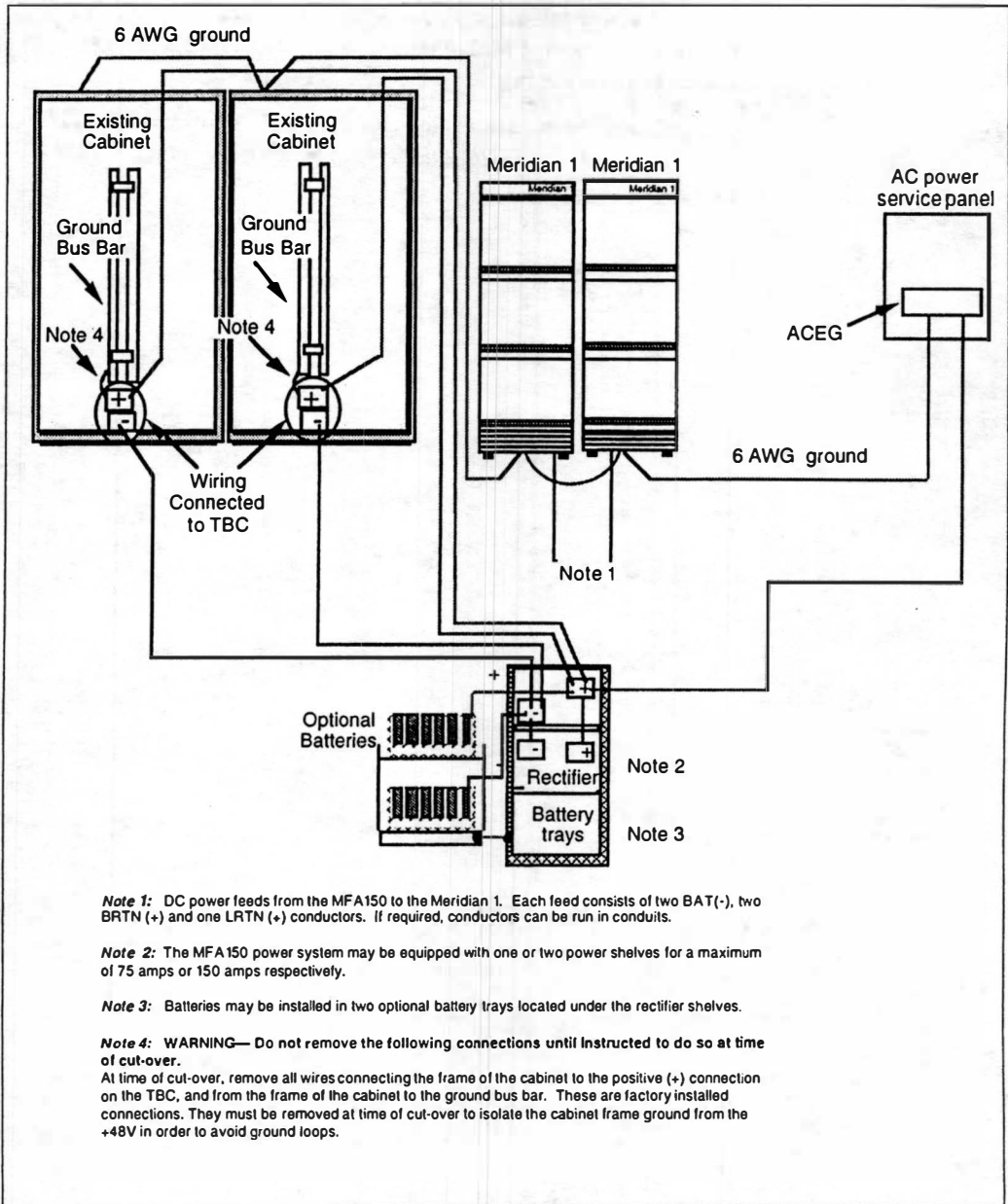
Customer provided power as a common power source

- A QBL12 Battery Distribution Box is normally used to connect to a customer provided DC power source. Figure 26-6 illustrates a customer provided common power supply arrangement for the upgraded system. This includes both Option 51C modules and the existing cabinet. A full description of QBL12 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 26-6**Typical arrangement using a customer provided common DC power supply**

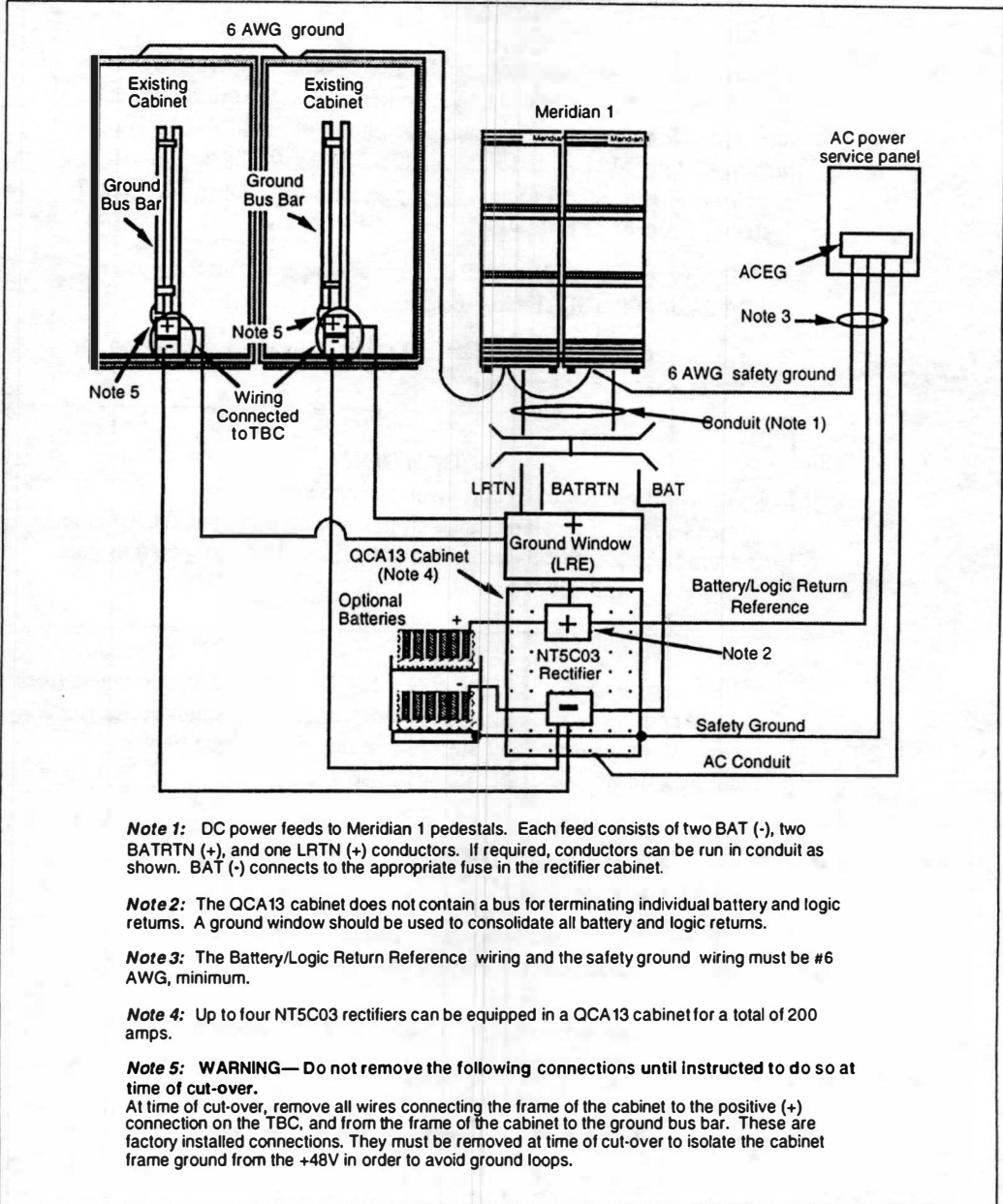
An MFA150 power system as a common power source

- An MFA150 power system assembly can be used as a common power source for both the Option 51C and the existing cabinets as shown in Figure 26-7. To connect the existing cabinets, disconnect the + and - 48V power leads from the existing power source, then reroute and connect them to the MFA150 power system. The connections are located under the top cover of the MFA150 power system. The connections at the TBC of the existing cabinet do not change.
- More information about connections for the MFA150 power system is located in 553-3001-210, *System installation procedures*. Refer to the documentation provided with the existing system for information about disconnecting and removing the old rectifier and batteries.

Figure 26-7**Typical arrangement using an MFA150 power system as a common power source**

An existing QCA13 power cabinet as a common power source

- A QCA13 power cabinet equipped with rectifiers can be used as a common power source for both the Option 51C and the existing cabinets as shown in Figure 26-8.
- For information about connections for the QCA13 power cabinet, refer to 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.

Figure 26-8**Typical arrangement using a QCA13 as a common power source**

Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 51C modules.

These cables connect the System Monitor to the SDI Paddle Board in the Core Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures*, Appendix A to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section 'Separate power source' earlier in this document for a description of a separate DC power source.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 26-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 51C system:

- 1 Power up and initially load the Option 51C column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.

- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
 - 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
 - 4 The Meridian 1 Option 51C system is now operational.
-

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 51C column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 Connect an NT8D86 cable between the connector on the faceplate of the network card and the I/O panel of the Option 51C. One cable is required for each network loop.
- 2 Connect an NT8D73 shielded cable, up to 30 ft (9 m) in length, to the connector on the I/O panel of the Option 51C. Route the NT8D73 cable to the existing cabinet. Do not connect it to the Peripheral Buffer card in the existing cabinet at this time.

Note: Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

- 3 If required in the existing cabinet (see Note) connect an NT8D86 cable to the connector on the NT8D73 shielded cable from the Option 51C. Make sure that the connectors are locked together with the locking devices. Do not connect the cable to the faceplate of the Peripheral Buffer card at this time. It will be connected as part of the cutover procedure.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable.

Cutting-over

The following procedure describes how to cut-over to the Option 51C system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL12 or QCA13 unit**
Remove the fuses from the -48V fuse panel corresponding to each cabinet and column.
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.
- Note:* Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.

- **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
- 2 If required, perform power modifications to the existing cabinets.
 - 3 In the existing cabinets, remove the wiring connecting the frame of the cabinet to the positive (+) connection of the TBC, and the wiring connecting the frame to the cabinet ground bus bar. Refer to Figures 26-5 through 26-7.

Note: This wiring was factory installed. It must be removed to avoid ground loops when existing cabinets are used with Meridian 1 modules.

- 4 This step applies only to Meridian 1 modules connected to a DC power source.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150 or QCA13) or NT8D46AW (for QBL12) cable (see Figure 26-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
 - the QBL12, QBL15 or QCA13 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.
- 5 This step applies only if a new common power source with battery backup connected to a QBL12 or QBL15 battery distribution box is to be used.

Note: This step does not apply if the common power source uses an MFA150 rectifier.

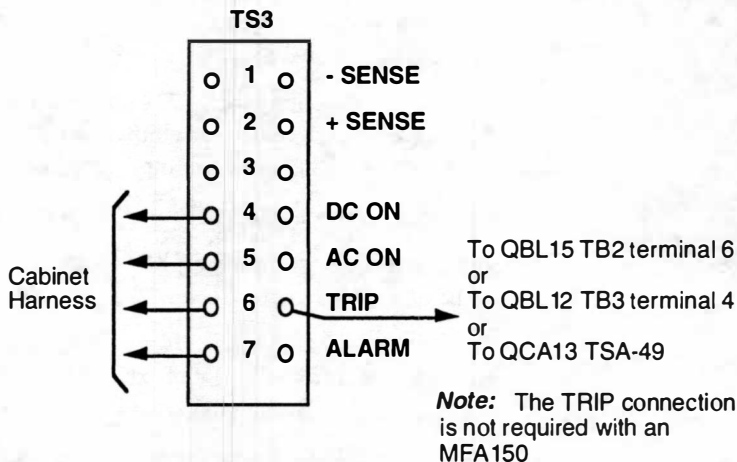
A TRIP lead must be connected to the TRIP connection on:

- the TRIP terminal on the terminal strip on the rectifier in existing cabinets equipped with a rectifier.
- the TRIP terminal of TS3 in existing cabinets not equipped with a rectifier.

The TRIP leads must be connected as follows.

If the existing rectifier is being removed from the cabinet, make the following wiring changes.

- a) If not already connected to TS3, tag and move the cabinet harness DC ON, AC ON, TRIP and ALARM leads presently connected on the rectifier to TS3 as shown in the above drawing. Depending on the type of existing cabinet, the TS3 is located either on the cabinet's TBC block, or on the QUT3 power unit.



- b) Install and connect a 16 AWG wire from terminal 6 (TRIP) on TS3 to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connections in each cabinet with 16 AWG wire.
- c) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.

Note: The DC ON, AC ON and ALARM lead functions are performed by the Meridian 1 module. Leaving these leads connected in the existing cabinets only extends the alarm indicators to the QPC84 power monitors. If you wish, you may leave these leads disconnected. However, the TRIP lead must be connected.

If the existing rectifier is to remain in the cabinet, make the following wiring changes.

- a) Install and connect a 16 AWG wire from the TRIP connection on the terminal strip of the rectifier to the TRIP connection in the QBL12 or QBL15 battery distribution box. If there are two or more existing cabinets, "daisy chain" the TRIP connection on the terminal strip of the rectifier in each cabinet with 16 AWG wire. In existing cabinets not equipped with a rectifier (such as a QCA7 cabinet powered by a QCA8 cabinet), 'daisy chain' to the TRIP connection on TS3.
 - b) Check the option switch D29 position 4 on all QPC84 power monitors in the existing cabinets. Switch D29 position 4 should be set to ON to allow trip input when reserve battery is provided.
- 6 Cross-connect the alarm cables as shown in Figure 26-10.
 - 7 Remove the jumper between SYSTIN and SYSTOUT on the P10 cable of the existing cabinet.
 - 8 Connect the NT8D86 cables (if provided) or NT8D73 shielded network cables from the Option 51C to the connector on the faceplate of the Peripheral Buffer circuit card in the existing cabinets.

Note: The NT8D86 cable in the existing cabinet is only required in double-sided cabinets to allow the doors to close properly. Single-sided cabinets (such as QCA7 or 8 cabinets) do not require an NT8D86 cable. The NT8D73 shielded cable can be connected directly to the connector of the Peripheral Buffer card.

—OR—

If the existing cabinet is equipped to suppress EMI, the NT8D73 shielded cable should be connected to its assigned filter connector. See 553-3001-150, *Upgrade Engineering* for more information.

- 9 Remove the QPC84 Power Monitor and from the QCA109 cabinet and set switch C11, position 2 to ON. The remaining switch settings remain unchanged. A QPC84 Power Monitor vintage Q or later is required.

Reinsert the QPC84 Power Monitor and set the ENB/DIS switch on its faceplate to ENB.

Note: Disregard any remaining alarm indications. Alarm indications should return to normal once the upgrade is completed and equipment that is no longer required has been removed as described later in this chapter.

- 10 Restore power to the cabinets and column by reinserting the removed fuse and resetting all circuit breakers to ON.

CAUTION

Do not remove the NT8D22 system monitor (XSM) from the column while the system is in service. Removing the XSM may cause the input circuit breakers on the existing cabinets to trip.

- 11 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.
-

Figure 26-9
NT8D46 cable types

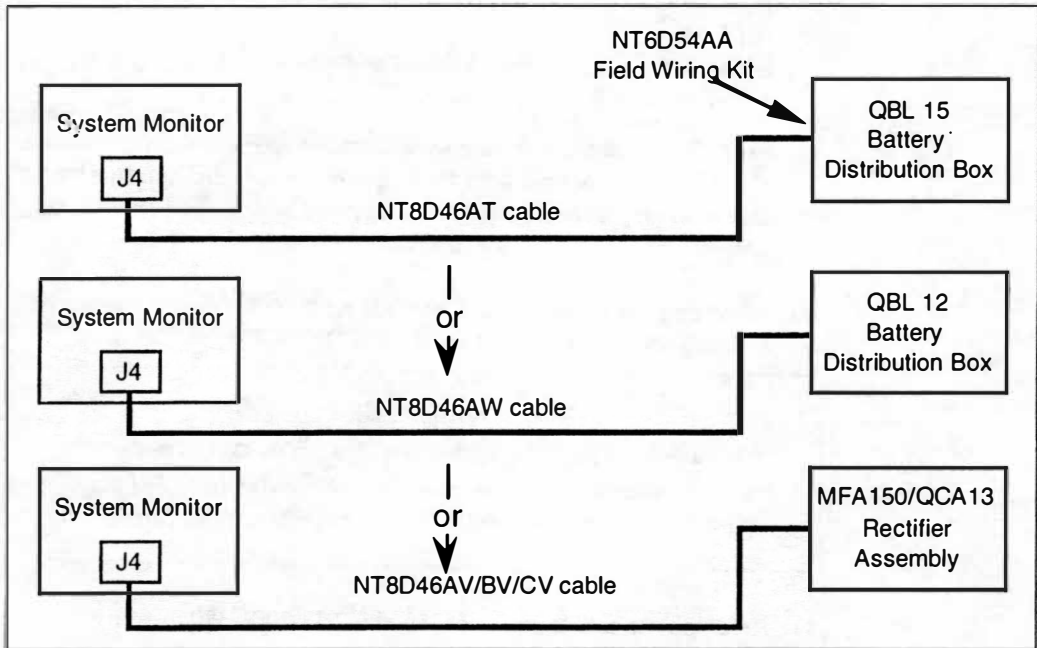
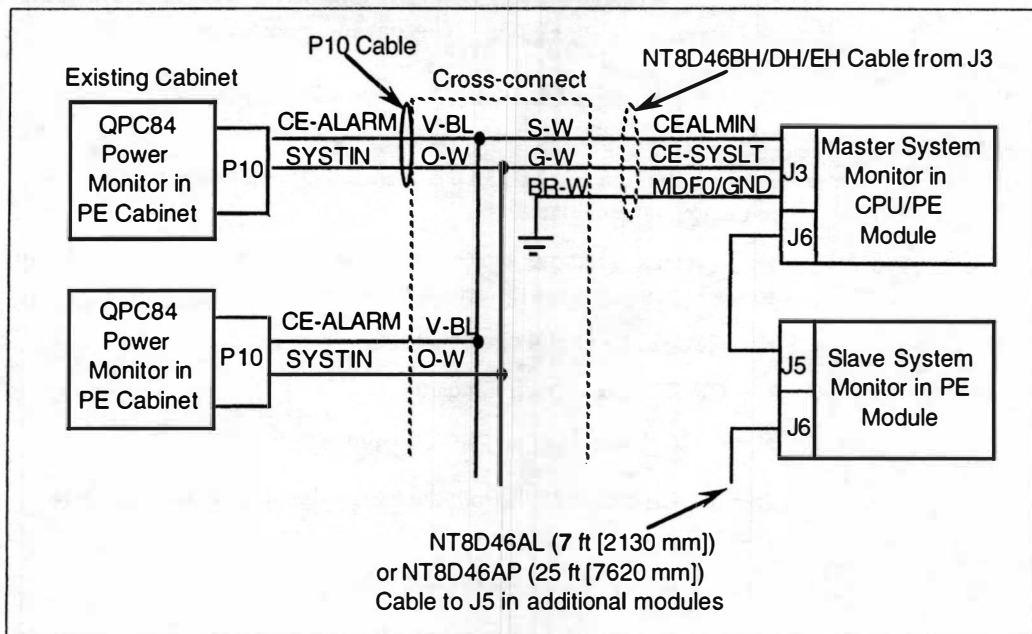


Figure 26-10**Connecting alarm cables between a cabinet and a column**

Note: Make sure there is no jumper between SYSTIN and SYSTOUT on P10 of the existing cabinet.

Removing equipment no longer required

The following procedure describes how to remove the equipment that is no longer required once the Option 51C is operating normally.

- 1 Set circuit breakers CB7, CB8, CB9 and CB10 on the QSP43 power control shelf in the QCA109 cabinet to OFF.
- 2 Remove the fuse labeled TPUN1 from the QSP43 power control shelf in the QCA109 cabinet.
- 3 Disconnect and remove cables from connectors on the faceplate of the following circuit cards located on the CE shelf:
 - QPC425 CPU/SDI circuit card.
 - QPC376 network circuit cards.
 - QPC139 SDI2 circuit cards, if equipped.
- 4 Remove CE circuit cards from the CE shelf and store them in a safe place.
- 5 Remove the tape unit from the cabinet.

Note: The tape unit must first be removed before the tape unit connector can be disconnected.

- Disconnect the power connector from the cabinet power wiring harness to the shelf housing the tape unit or QMM38 Mass Storage Unit, if equipped.
 - Tape all exposed power leads with electrical insulation tape.
- 6 If you are using the main CE shelf for DTI/PRI cards:
 - Install the DTI/PRI cards in the CE shelf card slots.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the Core Network module of the Option 51C upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breakers CB7, CB8, CB9 and CB01 on the QSP43 power control shelf to ON.

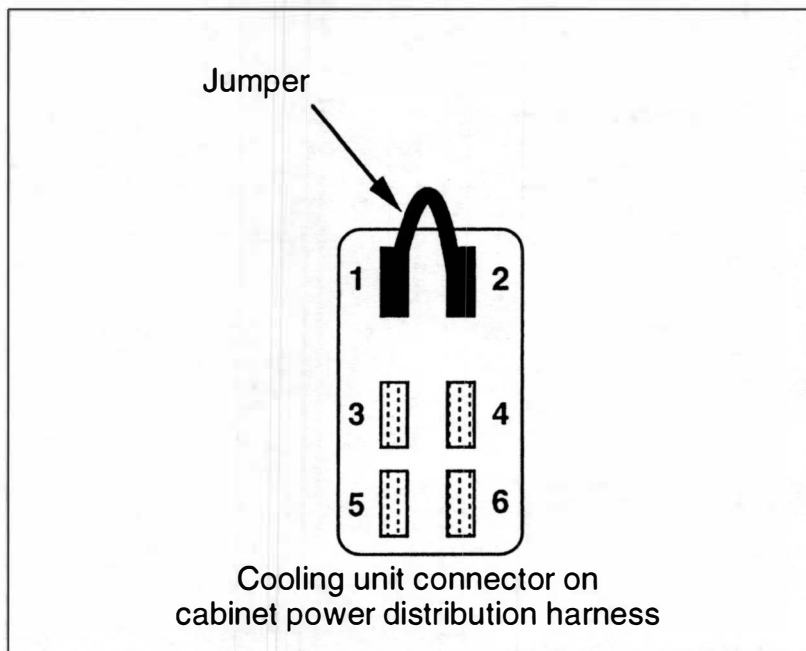
7 If you are not going to use the CE shelf for DTI/PRI cards:

- Disconnect the harness alarm connector C21 from the CE shelf.
- Unplug all remaining circuit cards from the CE shelf.
- Disconnect power connections from the backplane of the QSP39 shelf.

Note: If the cabinet is equipped with an expansion CE shelf (a second CE shelf) disconnect and remove the wiring between the +5V, +12V, -12V, and LGND connections on the CE shelf.

- Disconnect and remove the QUD15 cooling unit. Place a jumper (a piece of 24 or 26 AWG bare wire or a paper clip can be used) across power monitor leads 1 and 2 of the cooling unit power connector as shown in Figure 26-11. This disables the alarm for the removed unit.

Figure 26-11
Cooling unit alarm connection



SL-1 QCA136 cabinet upgrade to Meridian 1 Option 51C

This procedure is used to upgrade an SL-1 QCA136 cabinet (ST, 21 or 21E) to Meridian 1 Option 51C. To upgrade to a Meridian 1 Option 51C system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51C:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51C operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 51C is operating with the new software provided with it.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51C operational.

However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Modular upgrade of an SL-1 QCA136 cabinet (ST, 21 or 21E) to Meridian 1 Option 51C

Equipment required

Table 27-1 lists minimum hardware requirements needed to upgrade to a DC powered Meridian 1 Option 51C system.

Table 27-1

Minimum hardware requirements for a Meridian 1 Option 51C

Quantity			
AC System	DC System	Part number	Description
	1	NT6D41AB	CE Power Supply DC
1	1	NT6D63AA	Input/Output Processor (IO) Pack
1	1	NT6D64AA	Core Multi-Drive Unit (CMDU)
1	1	NT6D65AA	Core Network Interface (CNI) Pack
1	1	NT6D66AA	Call Processor (CP) Pack
1	1	NT6D6003	Core Bus Terminator (CBT) Pack
1		NT7D00AA	Top Cap AC
	1	NT7D00BA RIs 2	Top Cap DC
	1	NT7D09CA	Pedestal DC
	1	NT7D10CA	System Monitor Panel Assembly
	1	NT7D67CA	Power Distribution Unit and filter assembly
1	1	NT8D17AA RIs 9	Conference/TDS Card
1	1	NT8D22AC	System Monitor
1		NT8D27AB RIs 3	Pedestal AC
1		NT8D29AA RIs 4	CE/PE power supply AC
1	1	NT8D41AA RIs 2	2 Port SDI Paddle Board
1	1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	1	NT8D46BH	System Monitor to MDF Cable
-continued-			

Table 27-1 (continued)

Minimum hardware requirements for a Meridian 1 Option 51C

Quantity			
AC System	DC System	Part number	Description
1	1	NT8D46AX	System Monitor Cable for QCA136 cabinet or QCA137 cabinet and CE/PE module (see Figure 8-10 and 8-11)
		NT8D46BC	or System Monitor Cable for QCA136 and QCA137 cabinets and CE/PE module (see Figure 8-12)
1	1	NT8D52AA	Pedestal Blower unit AC
		NT8D52DC	Pedestal Blower Unit DC
1	1	NT8D53AB Rls 5	Power Distribution Unit AC
1		NT8D84AA	SDI Paddle Board to I/O Cable
	1	NT8D85AZ	CMA to CMA, 5 ft (1520 mm)
1	1	NT8D80AZ	CMA to CMA, 5 ft (1520 mm)
1	1	NT8D93AJ	SDI Paddle Board I/O to DTE/DCE, 16 ft (4875 mm)
1	1	NT8D99AB	Network to Network Module Cable 2 ft (610 mm)
1	1	NT9D11DC	Core Network (CN) Module
1	1	QPC43R	Peripheral Signaling Card
	1	QPC84Q	Power Monitor
1	1	QPC441B Series D	3 Port Extender Card
1	1	QPC477-9A	Bus Terminating Units
1	1	QPC477-10B	Bus Terminating Units

Note: The vintages shown on circuit cards in Table 27-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA136 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 51C Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 51C to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 51C to the existing cabinet.
- An NT9J98 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 51C system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 27-1 shows a typical QCA136 cabinet and Figure 27-2 shows a QCA136 cabinet that has been upgraded to Meridian 1 Option 51C.

Figure 27-1
Typical QCA136 cabinet

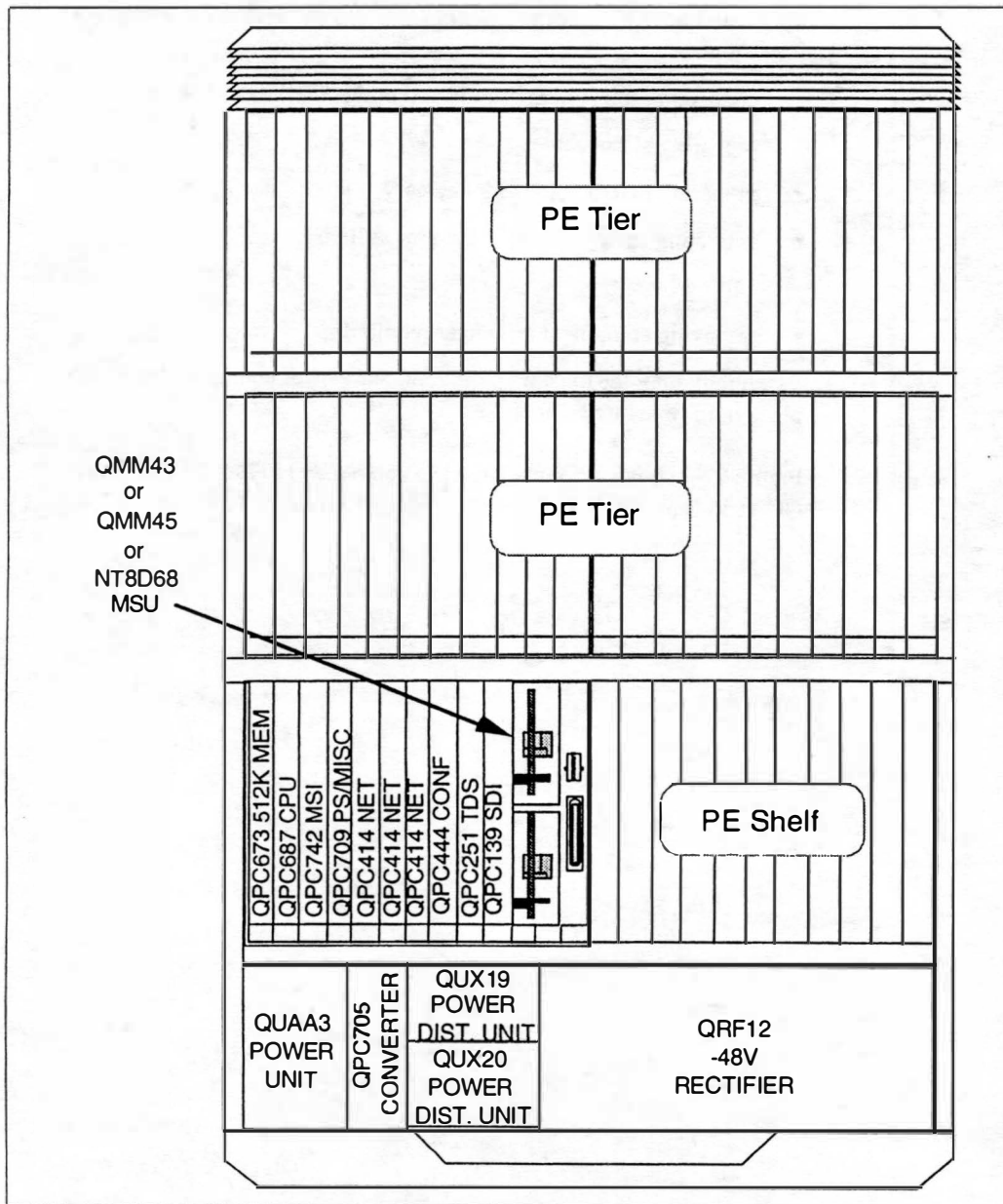
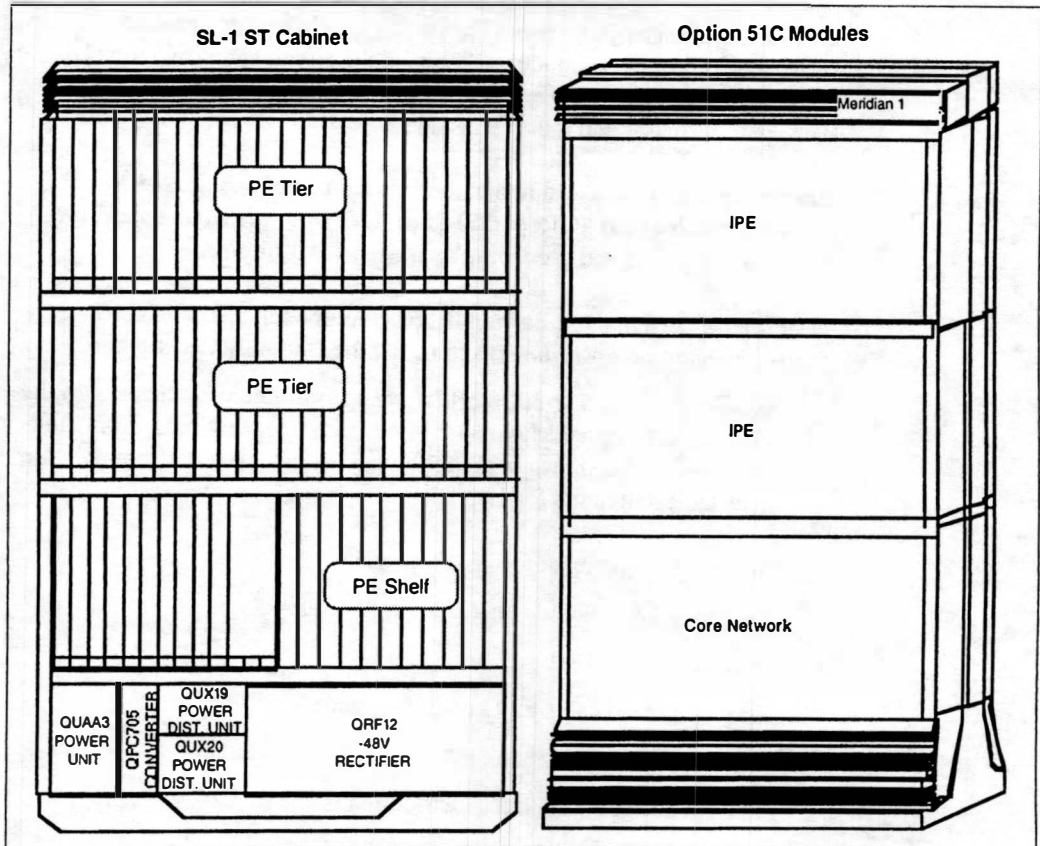


Figure 27-2

Typical QCA136 cabinet that has been upgraded to Meridian 1 Option 51C



Installing the Meridian 1 Option 51C system

The Option 51C equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, Core Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 51C equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 27-2 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.
- Install cabling:

- Cable common equipment
- Cable network loops (within the Option 51C columns only).

Note: Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.

- Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 51C equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 27-3 shows Option 51C circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 27-2**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
3	ON	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
	OFF	
4	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
5	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
	OFF	
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 27-2 (continued)**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 27-2 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves				Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."					
For each slave, indicates the slave address				Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."					
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master		on						
	slave		off						
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

Table 27-2 (continued)

NT8D22 system monitor — settings for total number of slaves — SW2 on master

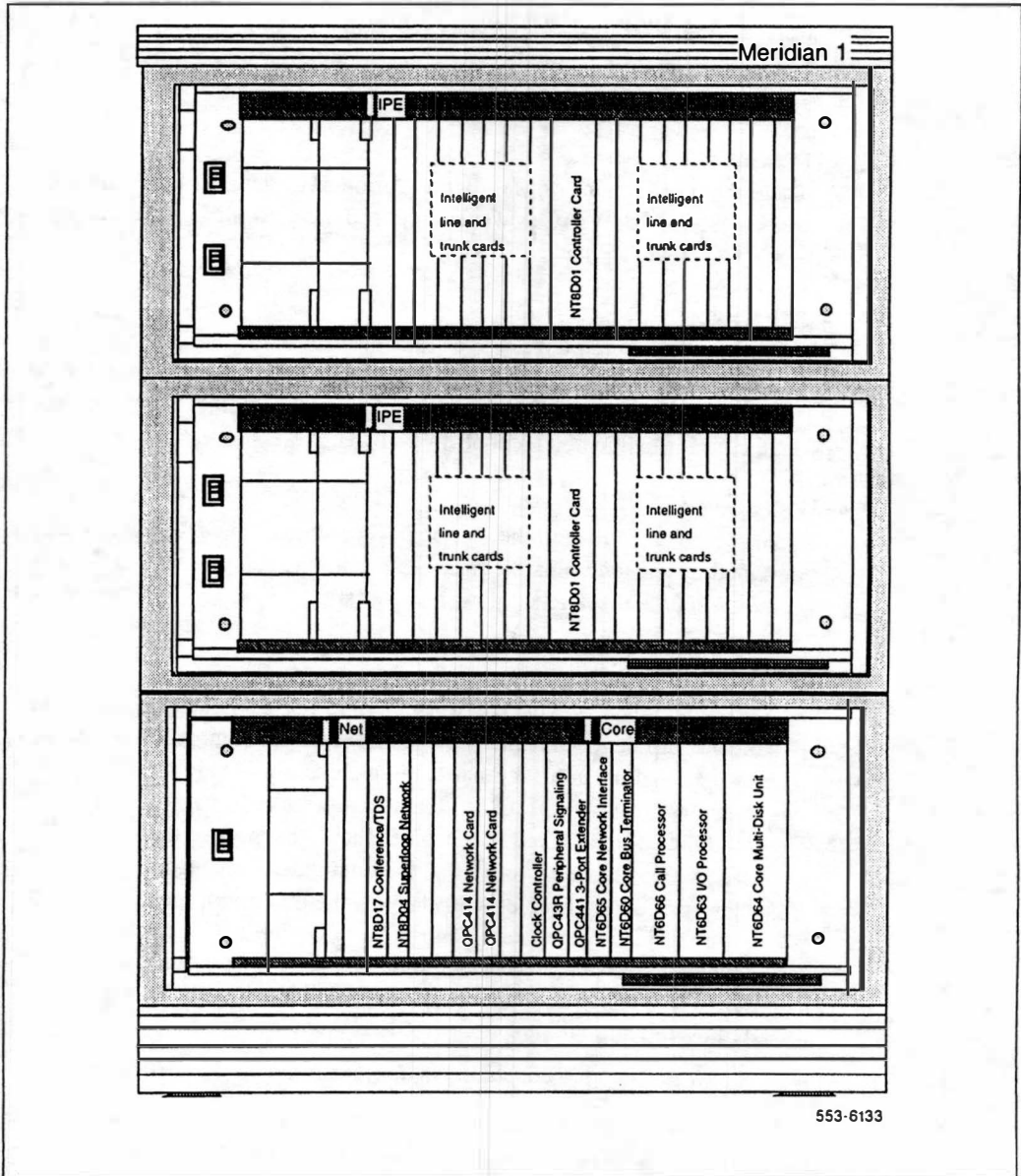
How many slave units		Switch position						How many slave units		Switch position					
		3	4	5	6	7	8			3	4	5	6	7	8
0		on	on	on	on	on	on	32		off	on	on	on	on	on
1		on	on	on	on	on	off	33		off	on	on	on	on	off
2		on	on	on	on	off	on	34		off	on	on	on	off	on
3		on	on	on	on	off	off	35		off	on	on	on	off	off
4		on	on	on	off	on	on	36		off	on	on	off	on	on
5		on	on	on	off	on	off	37		off	on	on	off	on	off
6		on	on	on	off	off	on	38		off	on	on	off	off	on
7		on	on	on	off	off	off	39		off	on	on	off	off	off
8		on	on	off	on	on	on	40		off	on	off	on	on	on
9		on	on	off	on	on	off	41		off	on	off	on	on	off
10		on	on	off	on	off	on	42		off	on	off	on	off	on
11		on	on	off	on	off	off	43		off	on	off	on	off	off
12		on	on	off	off	on	on	44		off	on	off	off	on	on
13		on	on	off	off	on	off	45		off	on	off	off	on	off
14		on	on	off	off	off	on	46		off	on	off	off	off	on
15		on	on	off	off	off	off	47		off	on	off	off	off	off
16		on	off	on	on	on	on	48		off	off	on	on	on	on
17		on	off	on	on	on	off	49		off	off	on	on	on	off
18		on	off	on	on	off	on	50		off	off	on	on	off	on
19		on	off	on	on	off	off	51		off	off	on	on	off	off
20		on	off	on	off	on	on	52		off	off	on	off	on	on
21		on	off	on	off	on	off	53		off	off	on	off	on	off
22		on	off	on	off	off	on	54		off	off	on	off	off	on
23		on	off	on	off	off	off	55		off	off	on	off	off	off
24		on	off	off	on	on	on	56		off	off	off	on	on	on
25		on	off	off	on	on	off	57		off	off	off	on	on	off
26		on	off	off	on	off	on	58		off	off	off	on	off	on
27		on	off	off	on	off	off	59		off	off	off	on	off	off
28		on	off	off	off	on	on	60		off	off	off	off	on	on
29		on	off	off	off	on	off	61		off	off	off	off	on	off
30		on	off	off	off	off	on	62		off	off	off	off	off	on
31		on	off	off	off	off	off	63		off	off	off	off	off	off
— continued —															

Table 27-2 (continued)

NT8D22 system monitor — slave address — SW2 on slave

Slave unit address							Position						
	3	4	5	6	7	8		3	4	5	6	7	8
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	on	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
32	off	on	on	on	on	on							

Figure 27-3
Meridian 1 Option 51C Core Network and IPE modules



Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 51C: one that is designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 51C, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Connect the DC power to the Option 51C columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 51C equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 51C module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 51C modules.
- a new power source installed in conjunction with the Option 51C.

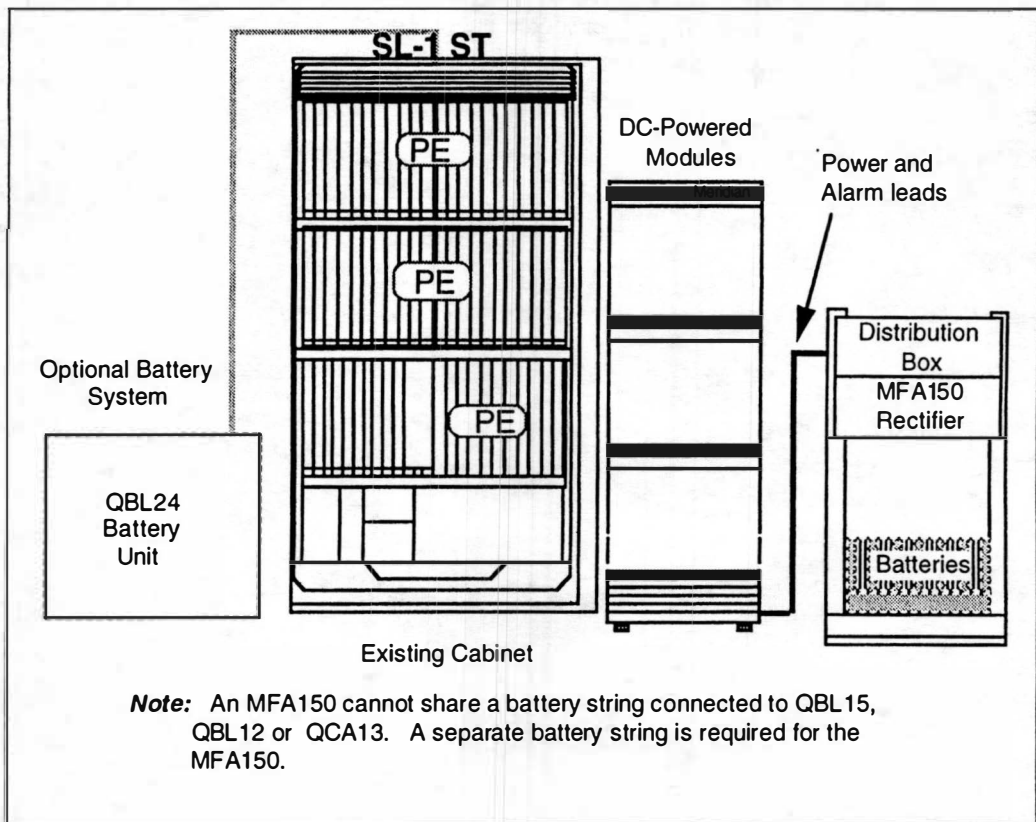
To determine the power requirements for the Option 51C system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 27-4 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 51C modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 51C column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 27-4

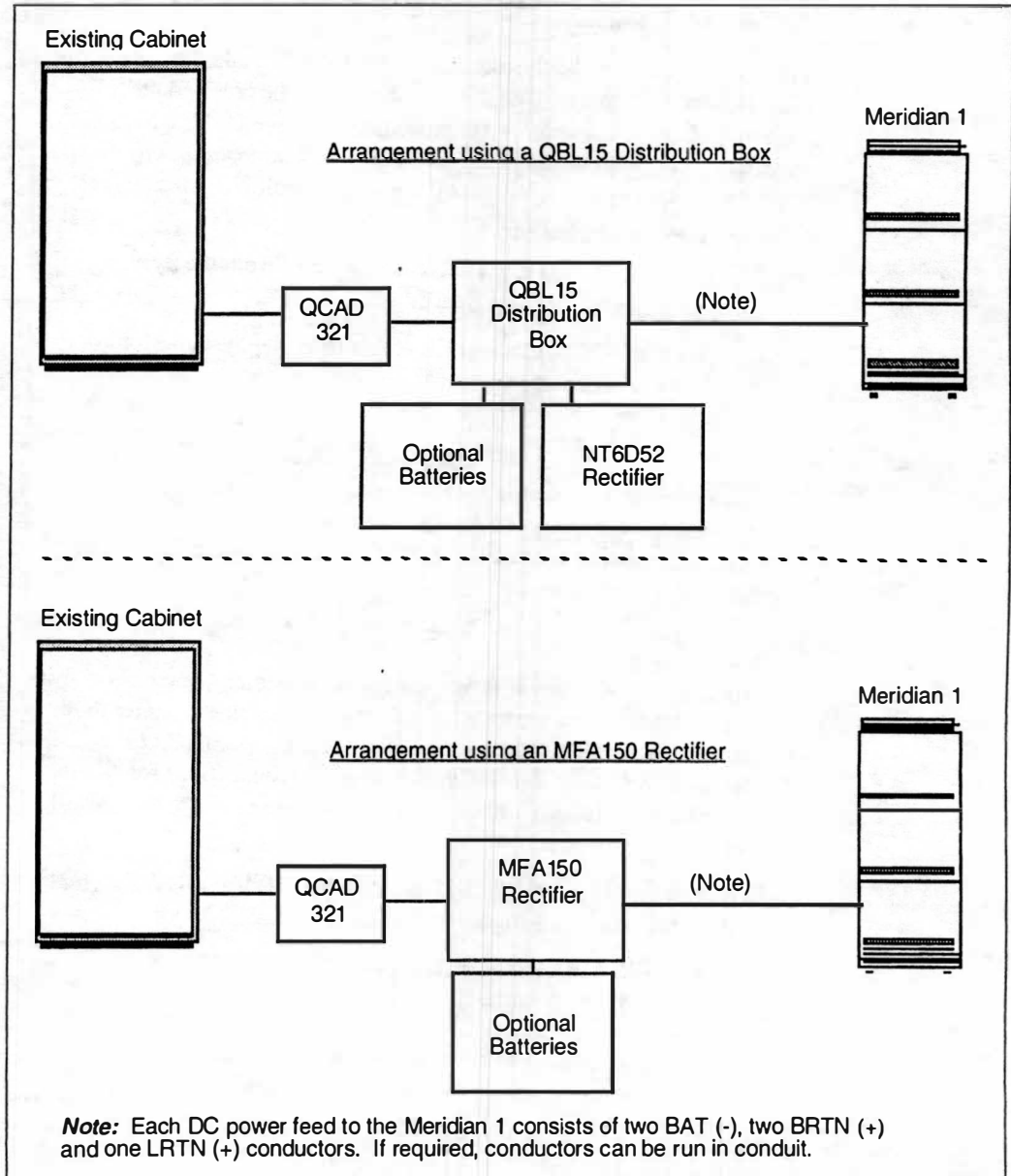
Typical arrangement of independently DC-powered Meridian 1 Option 51C modules



Common power source

Existing cabinet rectifier as a common power source

- For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 27-5 illustrates a common power supply arrangement for the upgraded system. This includes both Option 51C modules and the existing cabinet. Option 51C consists of two Core Network modules and an IPE module. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

Figure 27-5**Typical arrangement using a common DC power supply with optional battery backup**

Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 51C modules.

These cables connect the System Monitor to the SDI Paddle Board in the Core Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section '**Separate power source**' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150) cable (see Figure 27-13) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL15 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 51C system:

- 1 Power up and initially load the Option 51C column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.
 - 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
 - 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
 - 4 The Meridian 1 Option 51C system is now operational.
-

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 51C column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 If EMI regulations apply to the existing cabinet, install the NT9J98 and NT8D73 cable(s) as follows:(see Figure 27-6)
 - Feed the hooded end of the NT9J98 cable(s) through the rear EMI panel of the cabinet.
 - Attach the I/O panel end of the NT9J98 cable(s) to the rear EMI panel (see Figure 27-8).
 - Layout the hooded end of the NT9J98 cable(s) to the DLB card in the cabinet.
 - If two NT9J98 cables are mounted at a single I/O panel opening, attach the support plate provided with the NT9J98 cable using the screws also provided (see Figure 27-9).
 - Connect the NT8D73 cable(s) to the NT9J98 cable(s). Secure the connection with the bail locks on the NT9J98 cable(s).
 - Connect the other end the NT8D73 cable(s) to its assigned connector on the Meridian 1 module. Each loop requires one cable.
- 2 This step applies only if the existing cabinet is not subject to EMI regulations.(see Figure 27-7)
 - Layout a NT8D85 cable between the QPC414 Network Card and the DLB card.

Figure 27-6
Cable types and cable routing — EMI suppression

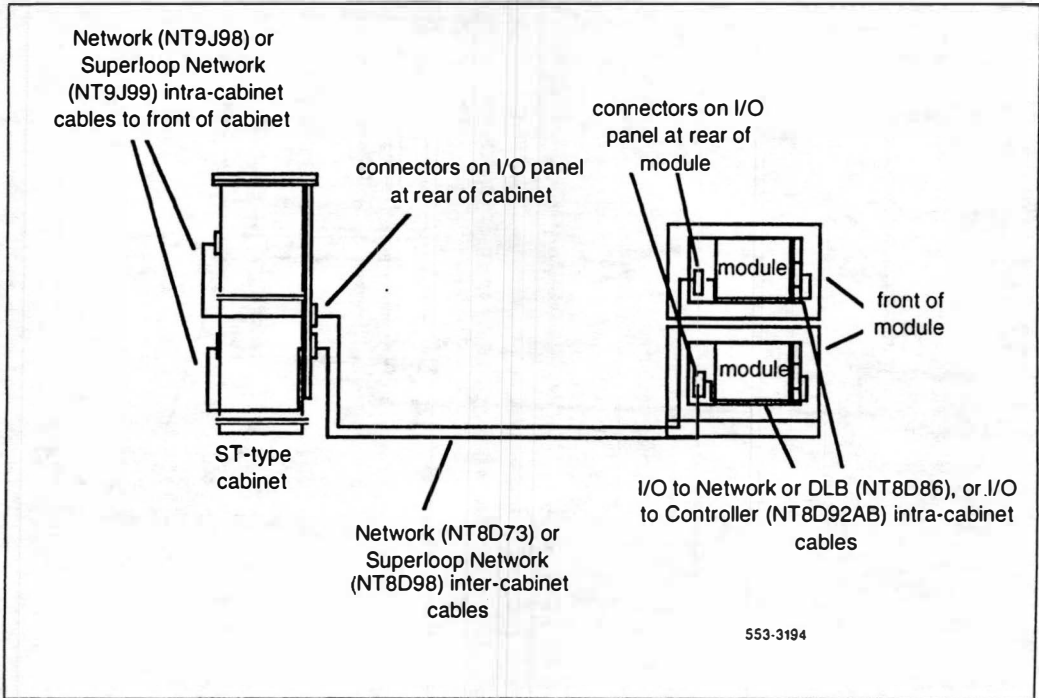


Figure 27-7
Cable types and cable routing — without EMI suppression

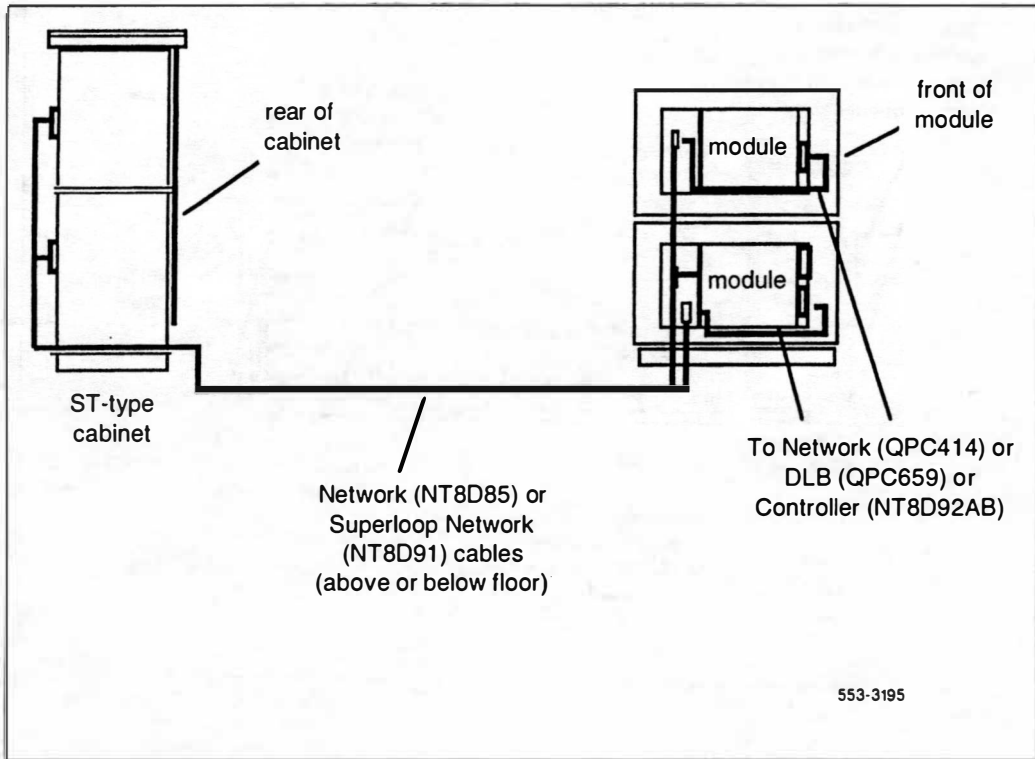


Figure 27-8
Installing NT9J98 cable on EMI panel

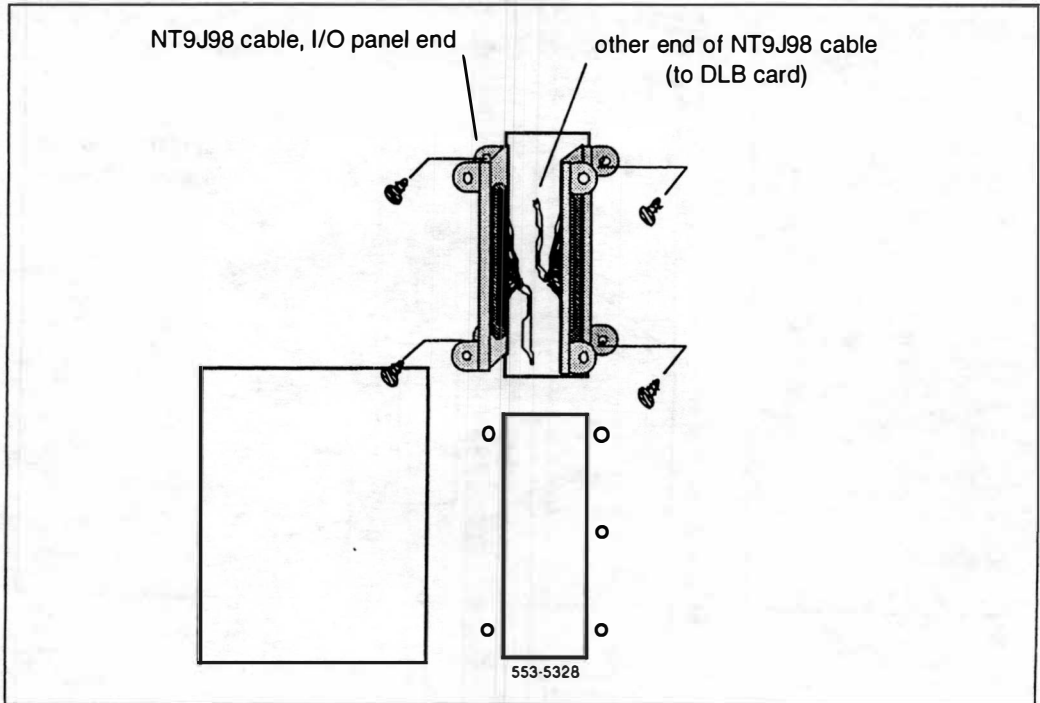
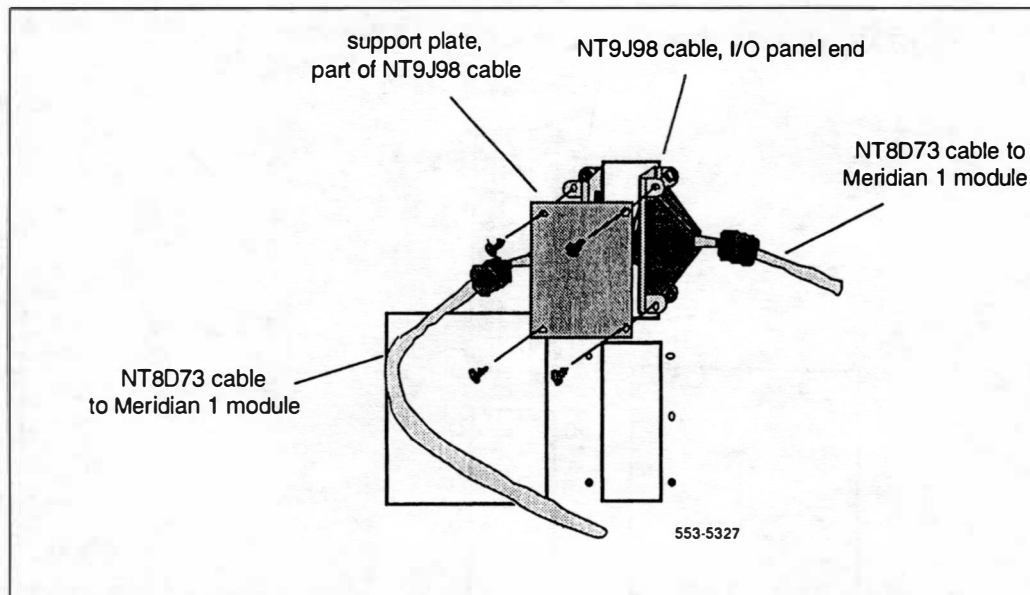


Figure 27-9
Installing NT8D73 cable on EMI panel



Cutting-over

The following procedure describes how to cut-over to the Option 51C system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.
Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.
 - **QBL24**
Set the circuit breaker on the battery unit to OFF.
Set the circuit breaker on the rectifier in the QCA136/QCA137 to off
 - **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
- 2 Connect the previously prepared network cables to their assigned Peripheral Buffer or Controller card in the existing cabinet.
- 3 This step applies only to Meridian 1 modules connected to a DC power source.

CAUTION

When a **common** DC power source is used, **do not** connect a TRIP lead to the existing QCA136 or 137 cabinet.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150) cable (see Figure 27-13) from connector J4 to:

- the MFA150 as described in 553-3001-210,
System Installation Procedures,
or
- the QBL15 as described in the Appendix A, 553-3001-210,
Installing and connecting.

- 4 Go to the next procedure and connect the system monitor according to the system configuration. There are three configurations described. They are:

Configuration 1 — QCA136 cabinet and CE/PE Module

Configuration 2 — QCA137 cabinet and CE/PE Module

Configuration 3 — QCA136, QCA137 cabinet and CE/PE Module

Connecting system monitor

The following three procedures describe the method of connecting the system monitor to each of the three possible ST configurations.

Configuration 1

Connecting system monitor ST system with QCA136 and CE/PE Module

The following procedure describes how to connect the system monitor in an ST system equipped with a QCA136 cabinet and a CE/PE Module. The CPU is located in the module.

Note: This procedure requires removing the EMI back panel from the cabinet. If alarm monitor connections to the MDF are not required for remote alarm, CE alarm, SYSIN/SYSOUT or power fail transfer, skip steps 1 through 4 and directly install connector P1 of the NT8D46AX cable into connector J3 of the system monitor, ensuring the connections with a screwdriver.

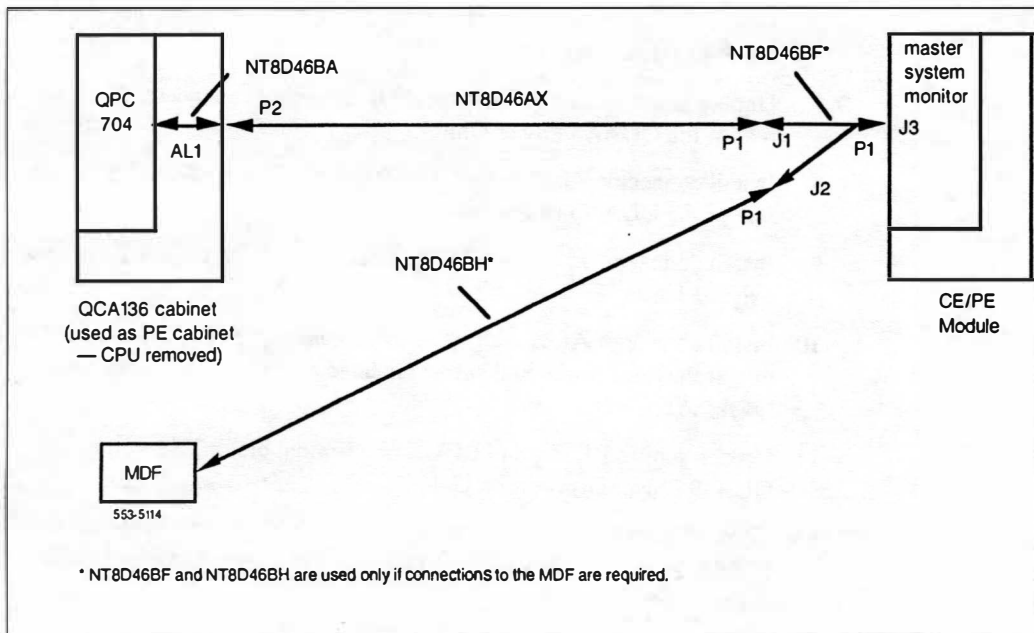
- 1 Install connector P1 of the NT8D46AX cable into connector J1 of the NT8D46BF cable. Ensure the connection with a screwdriver.

- 2 Install connector P1 of the NT8D46BF cable into connector J3 of the system monitor. Ensure the connection with a screwdriver.
- 3 Install connector P1 of the NT8D46BH cable into connector J2 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 4 Terminate the other end of the NT8D46BH cable.
- 5 Remove the QCA136 rear panels.
- 6 Remove the QCA136 EMI back panel. Verify that the GND1 and GND2 cables are tied together on the ground bar at the back of the QUAA3 Power Unit.
- 7 Unplug connector P5 of the existing harness from connector J5 on the rear of the QUAA3 Power Unit.
- 8 Install connector P5 of the NT8D46BA cable into connector J5 on the rear of the QUAA3 Power Unit.
- 9 Install connector J5 of the NT8D46BA cable into connector P5 of the existing harness.
- 10 Install connector ALM1 into the filter connector (P0678258) located in one of the three horizontal cutouts located at the bottom rear of the QCA136 cabinet.
- 11 Loosen screws REMA and REMB on terminal block TB2 of the QUX19 Power Distribution Unit.
- 12 Connect lug REMA (yellow wire) from the NT8D46BA cable to screw REMA on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw REMA.
- 13 Connect lug REMB (black wire) from the NT8D46BA cable to screw REMB on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw REMB.
- 14 Loosen one of the ground lugs located on the ground bar on the rear of the QUAA3 Power Unit with a 7/16" socket driver.
- 15 Connect the GND ring lug (2 black wires) to the loosened ground lug on the rear of the QUAA3 Power Unit and tighten with the socket driver.
- 16 Reinstall the EMI back panel.
- 17 Reinstall the QCA136 rear panels.

- 18 Restore power to the cabinet and column by reinserting the removed fuse and resetting all circuit breakers to on. Verify that all alarm LEDs on the QUAA3 Power Unit are on, except the CE/PE 1 LED which is on after approximately 90 seconds. Verify that the maintenance console displays message:

PWR0055 00 0 0

Figure 27-10
Connecting system monitor — Configuration 1



Fault clearing

After powering up the system and sysloading is complete, wait 90 seconds then verify the following:

- 1 The PFTU (if installed) is not activated.
- 2 All LEDs on the QUAA3 Power Unit stay on. If not, verify that steps 13 through 22 of the installation procedure have been completed.
- 3 The LED on the top cap of the CE/PE Module is off. If not, perform one of the following:
 - unseat the system monitor, verify the switch settings (Table 27-2), and reinstall it into the pedestal
 - use LD37, Input/Output Diagnostic, and issue the command "STAT XSM" to identify the fault. See *X11 input/output guide* (553-3001-400).

To verify the installation, perform the following optional procedure on the CE/PE Module:

- 1 Locate the blower unit inside the pedestal of the CE/PE Module.
- 2 Set the circuit breaker on the blower unit to off. Verify the following:
 - the LED on the top cap is on
 - all LEDs on the QUAA3 Power Unit stay on.
 - the maintenance console displays message:
PWR0006 FANU 00 0 0
- 3 Set the circuit breaker on the blower unit back on. Verify that the LED on the top cap is off, and the maintenance console displays message:
PWR0046 FANU 00 0 0
- 4 Perform a data dump using LD43.
- 5 Perform a sysload on the CE/PE Module. Verify the following:
 - the CE/PE 1 LED on the QUAA3 Power Unit is off
 - the PFTU (if installed) is activated
 - the LED on the top cap of the CE/PE Module is on
 - the LEDs on all ringing generators are off

6 Wait 90 seconds after the sysload, then verify the following:

- the CE/PE 1 LED is on
- the PFTU (if installed) is deactivated
- the LED on the top cap of the CE/PE Module is off
- the LEDs on all ringing generators are on
- the maintenance console displays messages:

PWR0056 PFTU XX X X
PWR0055 XSMC 00 0 0
PWR0000 PWSP XX X X
(for each ringing generator)

To verify the installation, perform the following optional procedure on the QCA136 cabinet:

1 Hardware disable the QPC659 DLB card and verify the following:

- the PE 2-5 LED on the QUAA3 Power Unit is off
- the LED on the top cap of the CE/PE Module is off
- the maintenance console displays message:

PWR0015 XSMC 00 0 0

2 Hardware enable the QPC659 DLB card. Verify that the PE 2-5 LED is on and the maintenance console displays message:

PWR0055 XSMC 00 0 0

If any test fails, verify that the QCAD309A and NT8D46AY cables are installed properly, and the switch settings on the system monitor are correct for this configuration.

Configuration 2

Connecting system monitor ST system with QCA137 and CE/PE Module

The following procedure describes how to connect the system monitor in an ST system equipped with a QCA137 cabinet and a CE/PE Module. The CPU is located in the module.

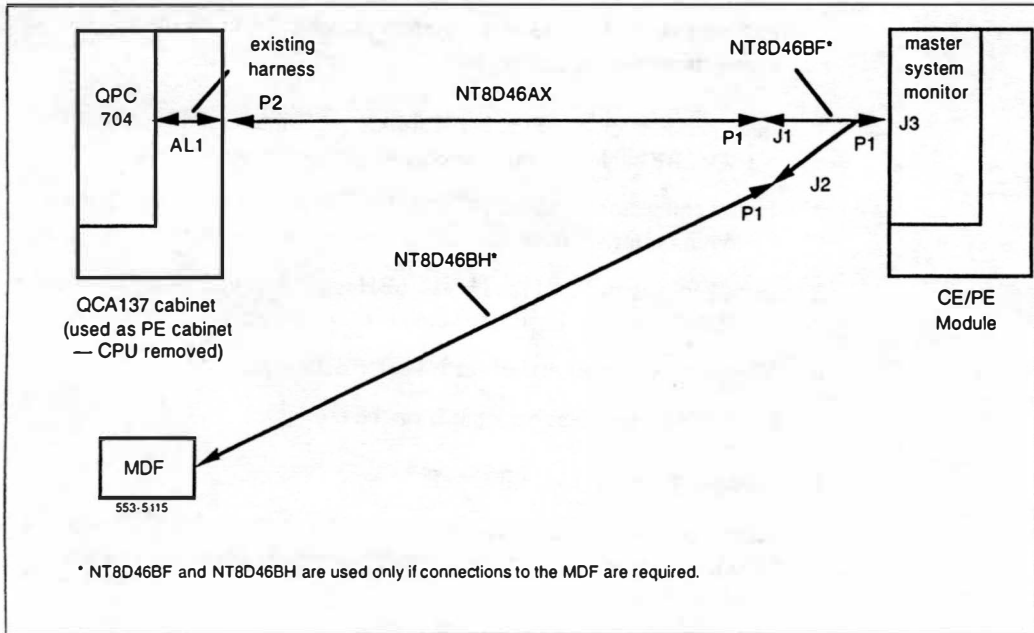
Note: This procedure requires removing the EMI back panel from the cabinet. If alarm monitor connections to the MDF are not required for remote alarm, CE alarm, SYSIN/SYSOUT or power fail transfer, skip steps 1 through 4 and directly install connector P1 of the NT8D46AX cable into connector J3 of the system monitor, ensuring the connections with a screwdriver.

- 1 Install connector P1 of the NT8D46AX cable into connector J1 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 2 Install connector P1 of the NT8D46BF cable into connector J3 of the system monitor. Ensure the connection with a screwdriver.
- 3 Install connector P1 of the NT8D46BH cable into connector J2 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 4 Terminate the other end of the NT8D46BH cable.
- 5 Reinstall the pedestal back panel on the module.
- 6 Remove the QCA137 rear panels.
- 7 Remove the QCA137 EMI back panel. Verify that the GND1 and GND2 cables are tied together on the ground bar at the back of the QUAA3 Power Unit.
- 8 Install connector P2 of the NT8D46AX cable into connector AL1 (P0678258 Filter Connector) at the bottom rear of the QCA137 cabinet. Ensure the connection with a screwdriver.
- 9 Reinstall the EMI back panel.
- 10 Reinstall the QCA137 rear panels.

- 11 Restore power to the cabinet and column by reinserting the removed fuse and resetting all circuit breakers to on. Verify that all alarm LEDs on the QUAA3 Power Unit are on, except the CE/PE 1 LED which is on after approximately 90 seconds. Verify that the maintenance console displays message:

PWR0055 00 0 0

Figure 27-11
Connecting system monitor — Configuration 2



Fault clearing

After powering up the system and sysloading is complete, wait 90 seconds then verify the following:

- 1 The PFTU (if installed) is not activated.
- 2 All LEDs on the QUAA3 Power Unit stay on. If not, verify cable connections.
- 3 The LED on the top cap of the CE/PE Module is off. If not, perform one of the following:
 - unseat the system monitor, verify the switch settings (Table 27-2), and reinstall it into the pedestal
 - use LD37, Input/Output Diagnostic, and issue the command "STAT XSM" to identify the fault. See *X11 input/output guide* (553-3001-400).

To verify the installation, perform the following optional procedure on the CE/PE Module:

- 1 Locate the blower unit inside the pedestal of the CE/PE Module.
- 2 Set the circuit breaker on the blower unit to off. Verify the following:
 - the LED on the top cap is on
 - all LEDs on the QUAA3 Power Unit stay on.
 - the maintenance console displays message:
PWR0006 FANU 00 0 0
- 3 Set the circuit breaker on the blower unit back on. Verify that the LED on the top cap is off and the maintenance console displays message:
PWR0046 FANU 00 0 0
- 4 Perform a data dump using LD43.
- 5 Perform a sysload on the CE/PE Module. Verify the following:
 - the CE/PE 1 LED on the QUAA3 Power Unit is off
 - the PFTU (if installed) is activated
 - the LED on the top cap of the CE/PE Module is on
 - the LEDs on all ringing generators are off

6 Wait 90 seconds after the sysload, then verify the following:

- the CE/PE 1 LED is on
- the PFTU (if installed) is deactivated
- the LED on the top cap of the CE/PE Module is off
- the LEDs on all ringing generators are on
- the maintenance console displays messages:

PWR0056 PFTU XX X X
PWR0055 XSMC 00 0 0
PWR0000 PWSP XX X X
(for each ringing generator)

To verify the installation, perform the following optional procedure on the QCA137 cabinet:

1 Hardware disable the QPC659 DLB card and verify the following:

- the PE 2-5 LED on the QUAA3 Power Unit is off
- the LED on the top cap of the CE/PE Module is off
- the maintenance console displays message:

PWR0015 XSMC 00 0 0

2 Hardware enable the QPC659 DLB card. Verify that the PE 2-5 LED is on, and the maintenance console displays message:

PWR0055 XSMC 00 0 0

If any test fails, verify that the NT8D46AX cable is installed properly, and the switch settings on the system monitor are correct for this configuration.

Configuration 3

Connecting system monitor ST system with QCA136, QCA137, and CE/PE Module

The following procedure describes how to connect the system monitor in an ST system equipped with a QCA136 cabinet, a QCA137 cabinet, and a CE/PE Module. The CPU is located in the module.

Note: This procedure requires removing the EMI back panels from both cabinets. If alarm monitor connections to the MDF are not required for remote alarm, CE alarm, SYSIN/SYSOUT or power fail transfer, skip steps 1 through 4 and directly install connector P1 of the NT8D46BE cable into connector J3 of the system monitor, ensuring the connections with a screwdriver.

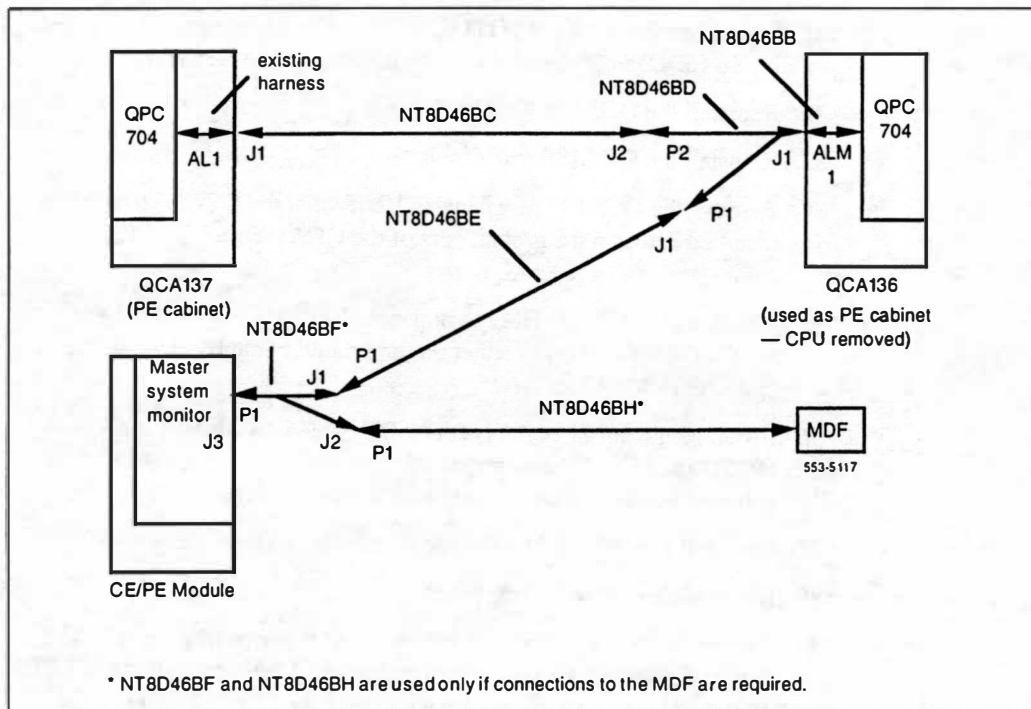
- 1 Install connector P1 of the NT8D46BF cable into connector J3 of the system monitor. Ensure the connection with a screwdriver.
- 2 Install connector P1 of the NT8D46BE cable into connector J1 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 3 Install connector P1 of the NT8D46BH cable into connector J2 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 4 Terminate the other end of the NT8D46BH cable.
- 5 Reinstall the pedestal back panel.
- 6 Remove the QCA136 rear panels.
- 7 Remove the QCA136 EMI back panel. Verify that the GND1 and GND2 cables are tied together on the ground bar at the back of the QUAA3 Power Unit.
- 8 Unplug connector P6 of the existing harness from connector J6 of the QCAD309 Alarm Cable.
- 9 Unplug connector P6 of the QCAD309 Alarm Cable from connector J6 of the QUAA3 Power Unit.
- 10 Unplug connector P4 of the existing harness from connector J4 of the QCAD309 Alarm Cable.
- 11 Unplug connector P4 of the QCAD309 Alarm Cable from connector J4 of the QUAA3 Power Unit.
- 12 Remove connector AL1 of the QCAD309 Alarm Cable from the P0678258 Filter Connector located in one of the three horizontal cutouts at the bottom rear of the QCA136 cabinet.
- 13 Remove the QCA309 Alarm Cable.
- 14 Remove the NE-25MQA1 Alarm Cable connecting the QCA136 and QCA137 cabinets.

- 15** Unplug connector P5 of the existing harness from connector J5 on the rear of the QUAA3 Power Unit.
- 16** Install connector P5 of the NT8D46BB cable into connector J5 on the rear of the QUAA3 Power Unit.
- 17** Install connector J5 of the NT8D46BB cable into connector P5 of the existing harness.
- 18** Install connector P4 of the existing harness into connector J4 on the rear of the QUAA3 Power Unit.
- 19** Unplug connector P6 of the existing harness from connector J6 on the QUAA3 Power Unit.
- 20** Install connector P6 of the NT8D46BB cable into connector J6 on the QUAA3 Power Unit.
- 21** Install connector J6 of the NT8D46BB cable into connector P6 of the existing harness.
- 22** Loosen screws XCE, REMA, and REMB on terminal block TB2 of the QUX19 Power Distribution Unit.
- 23** Connect lug XCE (white wire) from the NT8D46BB cable to screw XCE on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw XCE.
- 24** Connect lug REMA (yellow wire) from the NT8D46BB cable to screw REMA on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw REMA.
- 25** Connect lug REMB (black wire) from the NT8D46BB cable to screw REMB on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw REMB.
- 26** Loosen one of the ground lugs located on the ground bar on the rear of the QUAA3 Power Unit with a 7/16" socket driver.
- 27** Connect the GND ring lug (four black wires) to the loosened ground lug on the rear of the QUAA3 Power Unit and tighten with the socket driver.
- 28** Install connector ALM1 of the NT8D46BB cable into one of the three horizontal cutouts using the existing P0678258 Filter Connector.
- 29** Install connector J1 of the NT8D46BD cable into the P0678258 Filter Connector. Ensure the connection with a screwdriver.

- 30 Install connector J1 of the NT8D46BE cable into connector P1 of the NT8D46BD cable.
- 31 Install connector J2 of the NT8D46BC cable into connector P2 of the NT8D46BD cable. Ensure the connection with a screwdriver.
- 32 Reinstall the QCA136 EMI back panel.
- 33 Reinstall the QCA136 rear panels.
- 34 Remove the QCA137 rear panels. Verify that the QCAD310 cable is installed between the ground bars of the QCA136 and QCA137 cabinets.
- 35 Remove the QCA137 EMI back panel. Verify that the GND1 and GND2 cables are tied together on the ground bar at the back of the QUAA3 Power Unit.
- 36 Install connector J1 of the NT8D46BC cable into connector AL1 (P0678258 Filter Connector) at the bottom rear of the QCA137 cabinet. Ensure the connection with a screwdriver.
- 37 Reinstall the QCA137 EMI back panel.
- 38 Reinstall the QCA137 rear panels.
- 39 Restore power to the cabinet and column by reinserting the removed fuse and resetting all circuit breakers to on. Verify that all alarm LEDs on the QUAA3 Power Unit are on, except the CE/PE 1 LED which is on after approximately 90 seconds. Verify that the maintenance console displays message:

PWR0055 00 0 0

Figure 27-12
Connecting system monitor — Configuration 3



Fault clearing

After powering up the system and sysloading is complete, wait 90 seconds then verify the following:

- 1 The PFTU (if installed) is not activated.
- 2 All LEDs on the QUAA3 Power Units in the QCA136 and QCA137 cabinets stay on. If not, verify that steps 10, 11, and 14 through 33 of the installation procedure have been completed.
- 3 The LED on the top cap of the CE/PE Module is off. If not, perform one of the following:
 - unseat the system monitor, verify the switch settings (Table 27-2), and reinstall it into the pedestal
 - use LD37, Input/Output Diagnostic, and issue the command "STAT XSM" to identify the fault. See *X11 input/output guide* (553-3001-400).

To verify the installation, perform the following optional procedure on the CE/PE Module:

- 1 Locate the blower unit inside the pedestal of the CE/PE Module.
- 2 Set the circuit breaker on the blower unit to off. Verify the following:
 - the LED on the top cap is on,
 - all LEDs on the QUAA3 Power Units of the QCA136 and QCA137 cabinets stay on
 - the maintenance console displays message:
PWR0006 FANU 00 0 0
- 3 Set the circuit breaker on the blower unit back on. Verify that the LED on the top cap is off and the maintenance console displays message:
PWR0046 FANU 00 0 0
- 4 Perform a data dump using LD43.
- 5 Perform a sysload on the CE/PE Module. Verify the following:
 - all CE/PE I LEDs are off
 - the PFTU (if installed) is activated
 - the LED on the top cap of the CE/PE Module is on

- the LEDs on all ringing generators are off
- 6 Wait 90 seconds after the sysload, then verify the following:
- all CE/PE I LEDs are on
 - the PFTU (if installed) is deactivated
 - the LED on the top cap of the CE/PE Module is off
 - the LEDs on all ringing generators are on
 - the maintenance console displays messages:
PWR0056 PFTU XX X X
PWR0055 XSMC 00 0 0
PWR0000 PWSP XX X X
(for each ringing generator)

To verify the installation, perform the following optional procedure on the QCA136 cabinet:

- 1 Hardware disable the QPC659 DLB card and verify the following:
- the PE 2-5 LEDs on the QUAA3 Power Units of the QCA136 and QCA137 cabinets stay on
 - the LED on the top cap of the PE Module stays off
 - the maintenance console displays message:
PWR0015 XSMC 00 0 0
- 2 Hardware enable the QPC659 DLB card and verify that the PE 2-5 LEDs on the QUAA3 Power Units of the QCA136 and QCA137 cabinets are on. Verify that the maintenance console displays message:
PWR0055 XSMC 00 0 0

To verify the installation, perform the following optional procedure on the QCA137 cabinet:

- 1 Hardware disable the QPC659 DLB card and verify the following:
 - the PE 2-5 LED on the QUAA3 Power Unit of the QCA137 cabinet is off
 - the PE 2-5 LED on the QUAA3 Power Unit of the QCA136 cabinet stays on
 - the LED on the top cap of the CE/PE Module stays off
 - the maintenance console displays message:
PWR0015 XSMC 00 0 0
- 2 Hardware enable the QPC659 DLB card and verify that the PE 2-5 LEDs on the QUAA3 Power Units of the QCA136 and QCA137 cabinets are on. Verify that the maintenance console displays message:
PWR0055 XSMC 00 0 0

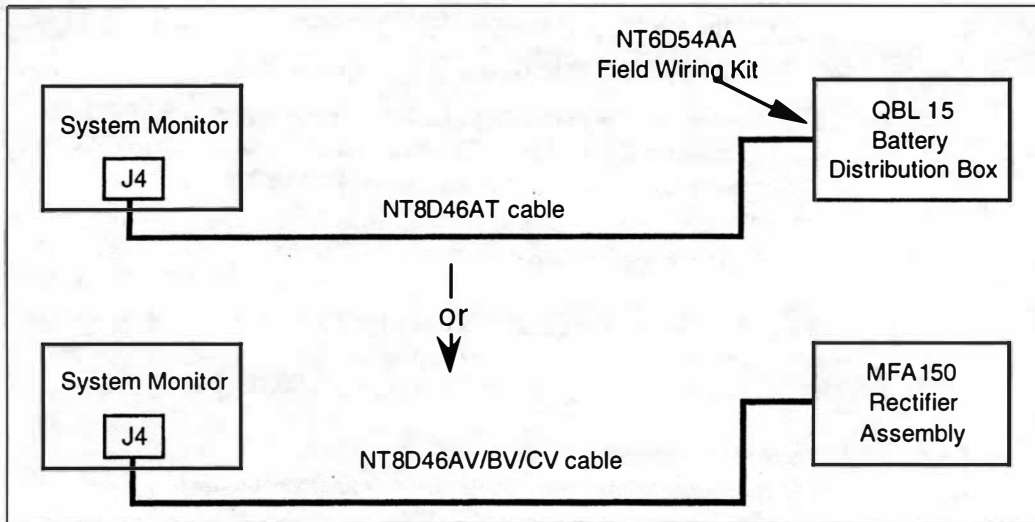
If any test fails, verify that all cables are installed properly, and the switch settings on the system monitor are correct for this configuration. On the QCA137 cabinet, verify the installation of the QCAD310 cable.

To remove equipment no longer required

- 1 Disconnect and remove cables from connectors on the faceplates of the circuit cards located on the CE shelf.
- 2 Remove circuit cards from the CE shelf and store them in a safe place.
- 3 Remove the mass storage unit from the QCA136 cabinet.
- 4 If you are using the CE shelf for DTI/PRI cards:
 - Install DTI/PRI cards in CE shelf card slots 3, 5, 7, 9, and 11.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the Core Network module of the Option 51C upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breaker for the CE shelf to ON.

- 5 If you are not going to use the CE shelf for DTI/PRI cards:
 - Install the power load card (NT6D81AA) in the CE shelf card slots 2 through 11.
 - 6 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.
-

Figure 27-13
NT8D46 cable types



SL-1 QCA141 cabinet upgrade to Meridian 1 Option 51C

This procedure is used to upgrade an SL-1 QCA141 cabinet (SN, ST or 21) to Meridian 1 Option 51C. To upgrade to a Meridian 1 Option 51C system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51C:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51C operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 51C is operating with the new software provided with it.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51C operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Modular upgrade of SL-1 QCA141 cabinet (SN, ST or 21) to Meridian 1 Option 51C

Equipment required

Table 28-1 lists minimum hardware requirements needed to modular upgrade a QCA141 cabinet to a Meridian 1 Option 51C.

Table 28-1
Minimum hardware requirements for a Meridian 1 Option 51C

Quantity			
AC System	DC System	Part number	Description
	1	NT6D41AB	CE Power Supply DC
1	1	NT6D63AA	Input/Output Processor (IO) Pack
1	1	NT6D64AA	Core Multi-Drive Unit (CMDU)
1	1	NT6D65AA	Core Network Interface (CNI) Pack
1	1	NT6D66AA	Call Processor (CP) Pack
1	1	NT6D6003	Core Bus Terminator (CBT) Pack
1		NT7D00AA	Top Cap AC
	1	NT7D00BA Rls 2	Top Cap DC
	1	NT7D09CA	Pedestal DC
	1	NT7D10CA	System Monitor Panel Assembly
	1	NT7D67CA	Power Distribution Unit and filter assembly
1	1	NT8D17AA Rls 9	Conference/TDS Card
1	1	NT8D22AC	System Monitor
1		NT8D27AB Rls 3	Pedestal AC
1		NT8D29AA Rls 4	CE/PE power supply AC
1	1	NT8D41AA Rls 2	2 Port SDI Paddle Board
1	1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	1	NT8D46BH	System Monitor to MDF Cable
-continued-			

Table 28-1 (continued)

Minimum hardware requirements for a Meridian 1 Option 51C

Quantity			
AC System	DC System	Part number	Description
1	1	NT8D46AX	System Monitor Cable for QCA136 cabinet or QCA137 cabinet and CE/PE module (see Figure 8-10 and 8-11)
		NT8D46BC	or System Monitor Cable for QCA136 and QCA137 cabinets and CE/PE module (see Figure 8-12)
1		NT8D52AA	Pedestal Blower unit AC
	1	NT8D52DC	Pedestal Blower Unit DC
1		NT8D53AB Rls 5	Power Distribution Unit AC
1	1	NT8D84AA	SDI Paddle Board to I/O Cable
	1	NT8D85AZ	CMA to CMA, 5 ft (1520 mm)
1	1	NT8D80AZ	CMA to CMA, 5 ft (1520 mm)
1	1	NT8D93AJ	SDI Paddle Board I/O to DTE/DCE, 16 ft (4875 mm)
1	1	NT8D99AB	Network to Network Module Cable 2 ft (610 mm)
1	1	NT9D11DC	Core Network (CN) Module
1	1	QPC43R	Peripheral Signaling Card
	1	QPC84Q	Power Monitor
1	1	QPC441B Series D	3 Port Extender Card
1	1	QPC477-9A	Bus Terminating Units
1	1	QPC477-10B	Bus Terminating Units

Note: The vintages shown on circuit cards in Table 28-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

EMI requirements

All QCA141 cabinets used in Canada were designed to meet regulatory requirements in effect at time of shipment. To meet present Electromagnetic Interference (EMI) requirements, the following network cables must be used to extend each network loop going from the Option 51C Universal Equipment Module (UEM) to the equipment in the existing cabinets:

- NT8D86 cable in the Option 51C to connect the Network card to the I/O panel.
- NT8D73 shielded cable to connect the I/O panel on the Option 51C to the existing cabinet.
- An NT9J98 cable to connect the NT8D73 cable to the Peripheral Buffer card in the existing cabinet.

Existing cabinets equipped to suppress EMI may require the installation of connector housings to connect the network cables. Additional information about cabinets and equipment designed to suppress EMI is located in 553-3001-150, *Upgrade Engineering*.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 51C system next to the existing cabinet
- connecting the system ground and power facilities, if necessary
- preparing alarm cables
- preparing external network cables
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing cabinet.

Figure 28-1 shows a typical QCA141 cabinet and Figure 28-2 shows a QCA141 cabinet that has been upgraded to Meridian 1 Option 51C.

Figure 28-1
Typical QCA141 cabinet

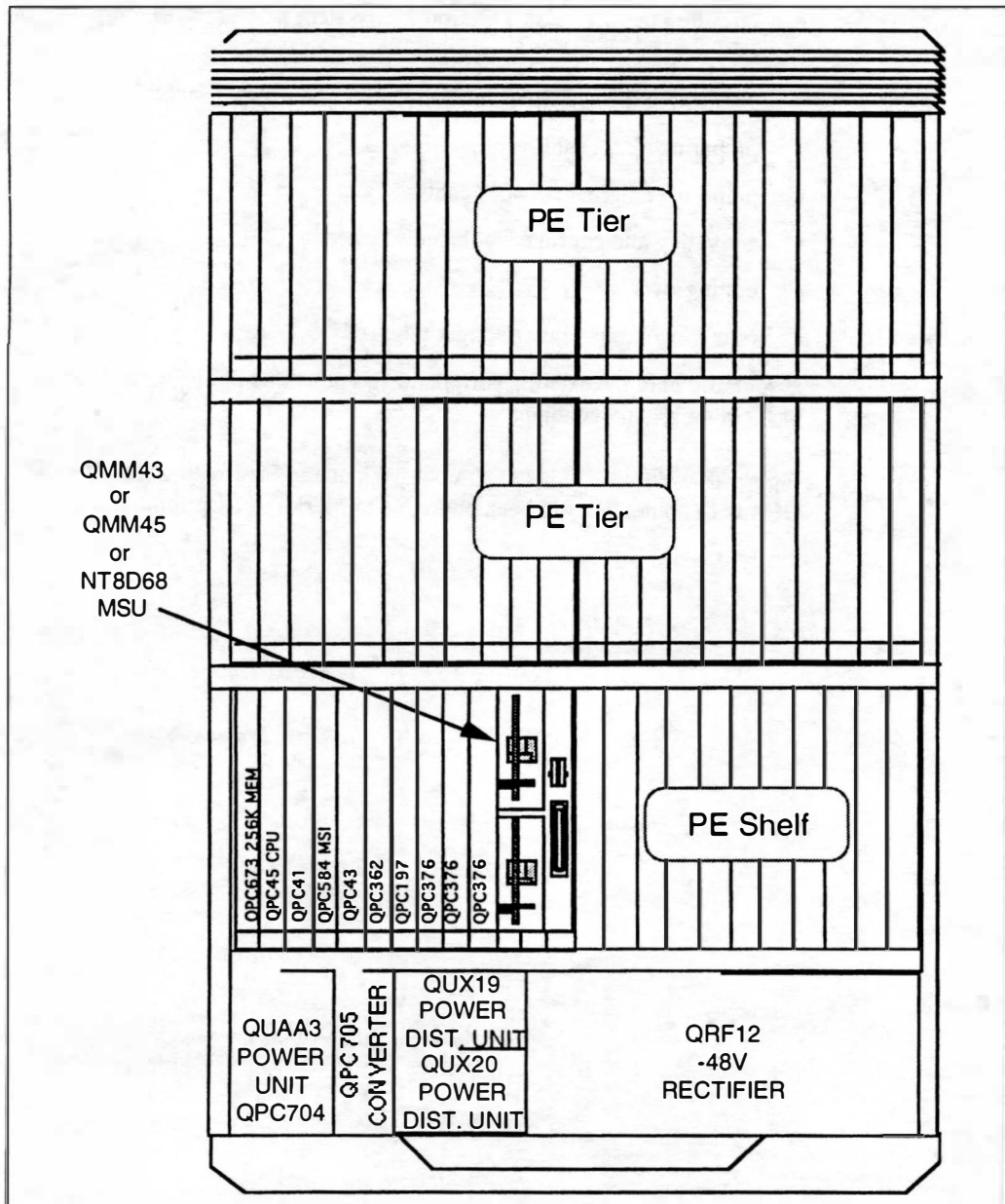
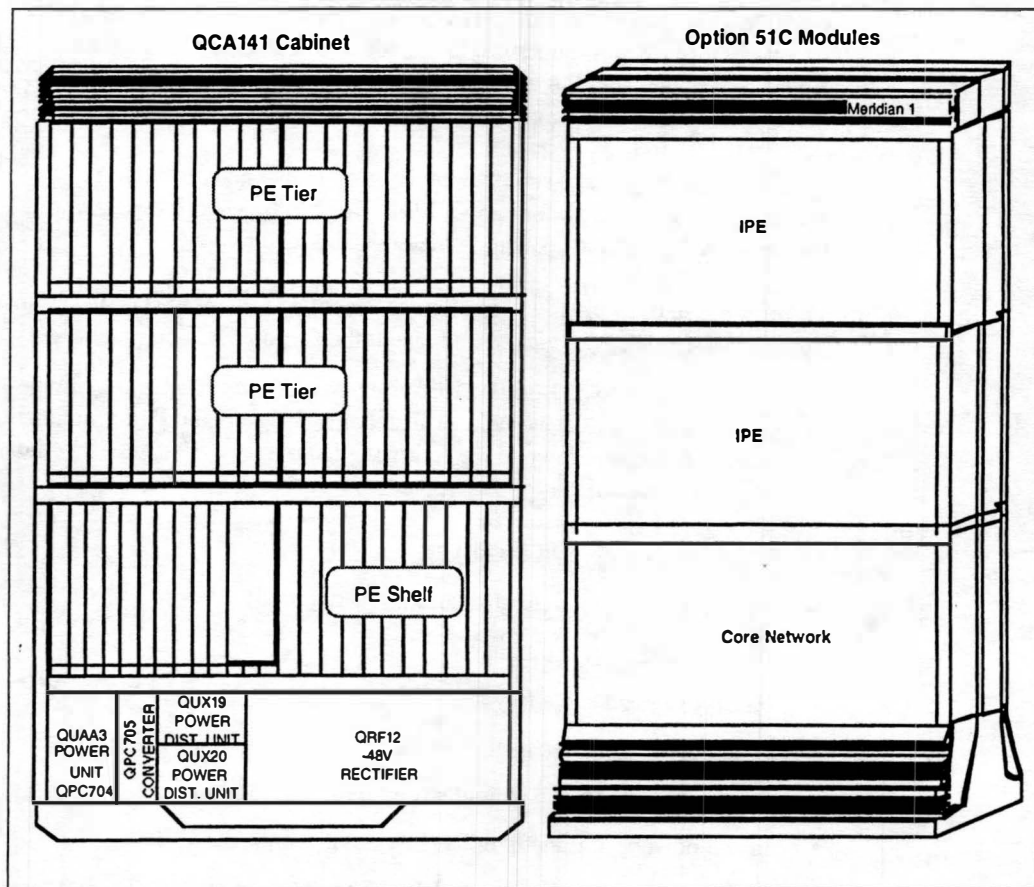


Figure 28-2**Typical QCA141 cabinet that has been upgraded to Meridian 1 Option 51C**

Installing the Meridian 1 Option 51C system

The Option 51C equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, Core Network modules, IPE module, circuit cards, and top cap. MDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 51C equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 28-2 for switch settings).

CAUTION

Do not connect the NT8D46AT, NT8D46AW or NT8D46AV system monitor to battery distribution box cable at this time. Connecting this cable now could result in system failure.

- Install a system terminal and a serial data interface (SDI) port.
- Install cabling:

- Cable common equipment
- Cable network loops (within the Option 51C columns only).

Note: Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.

- Cable PE/IPE modules to the MDF and connect lines and trunks.
- Inspect Option 51C equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 28-3 shows Option 51C circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 28-2
NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 28-2 (continued)**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 28-2 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves				Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."					
For each slave, indicates the slave address				Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."					
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master		on						
	slave		off						
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

Table 28-2 (continued)

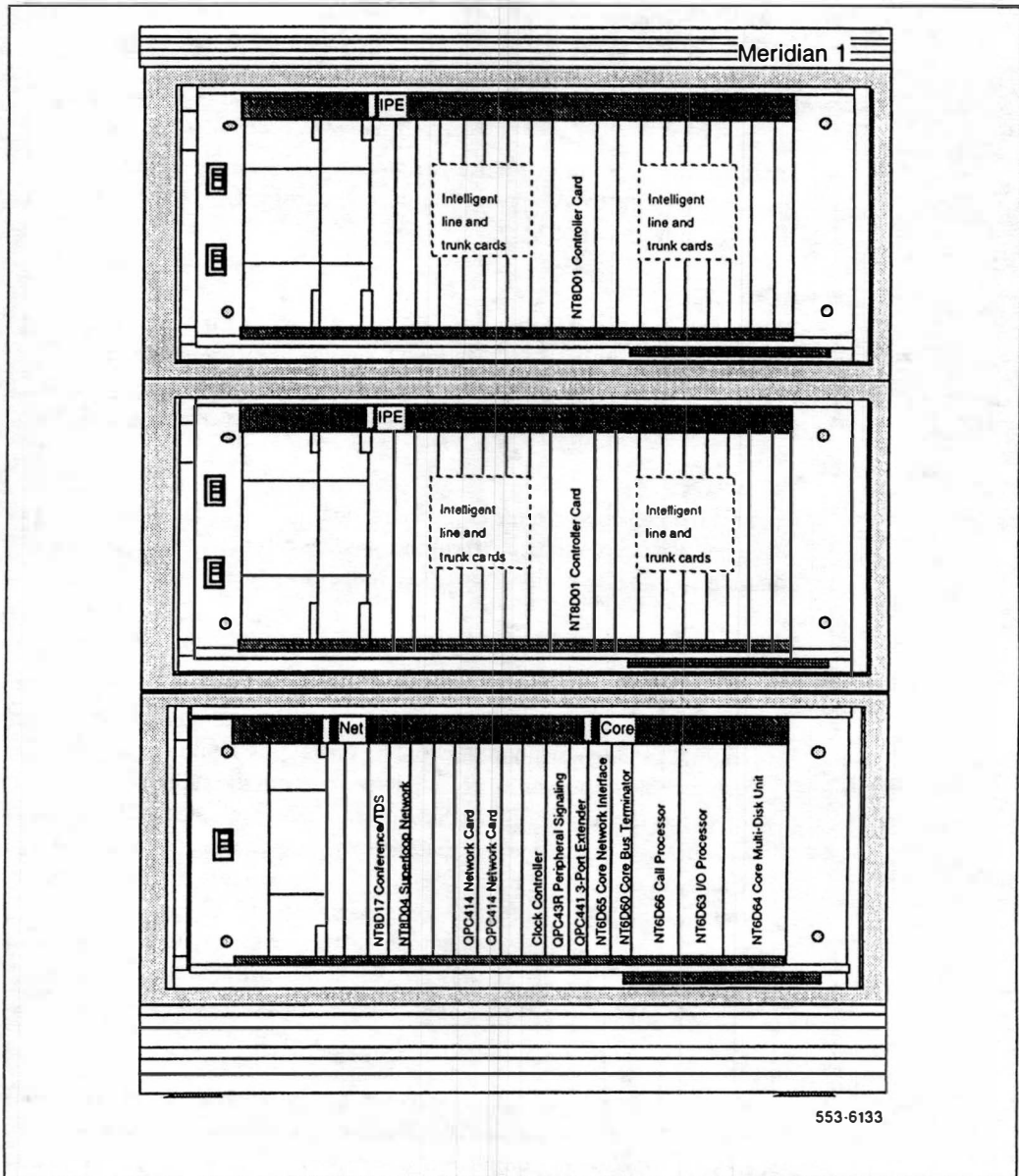
NT8D22 system monitor — settings for total number of slaves — SW2 on master

How many slave units	Switch position						How many slave units	Switch position					
	3	4	5	6	7	8		3	4	5	6	7	8
0	on	on	on	on	on	on	32	off	on	on	on	on	on
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
— continued —													

Table 28-2 (continued)
NT8D22 system monitor — slave address — SW2 on slave

Slave unit address Position							Slave unit address Position						
	3	4	5	6	7	8		3	4	5	6	7	8
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	on	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
32	off	on	on	on	on	on							

Figure 28-3
Meridian 1 Option 51C Core Network and IPE modules



Connecting system ground and power

Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, and the documentation provided with the existing system for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 51C: one that is designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source.

AC power

With the AC powered Option 51C, the new Meridian 1 modules are powered separately from the existing DC powered cabinets. Refer to 553-3001-210, *System Installation Procedures*, "Installing AC power" for detailed information about connecting power to AC powered systems.

DC power

Connect the DC power to the Option 51C columns. The DC power can be provided by a source separate from the existing cabinets, or it can share a common source if sufficient power is available.

A common source can be:

- the existing power source if sufficient power is available to supply the new equipment. The DC power source may be common to the existing cabinet and the new modular column containing Option 51C equipment. However, to be able to power both the cabinet and modules, the rectifier in the cabinet should be evaluated and calculations made to verify that the total worst case load including battery charging is at least 20% below the maximum rectifier output rating. This may be possible for a basic Option 51C module containing CE and network equipment, however, any further expansion of the column may not be possible without a separate rectifier column to power Option 51C modules.
- a new power source installed in conjunction with the Option 51C.

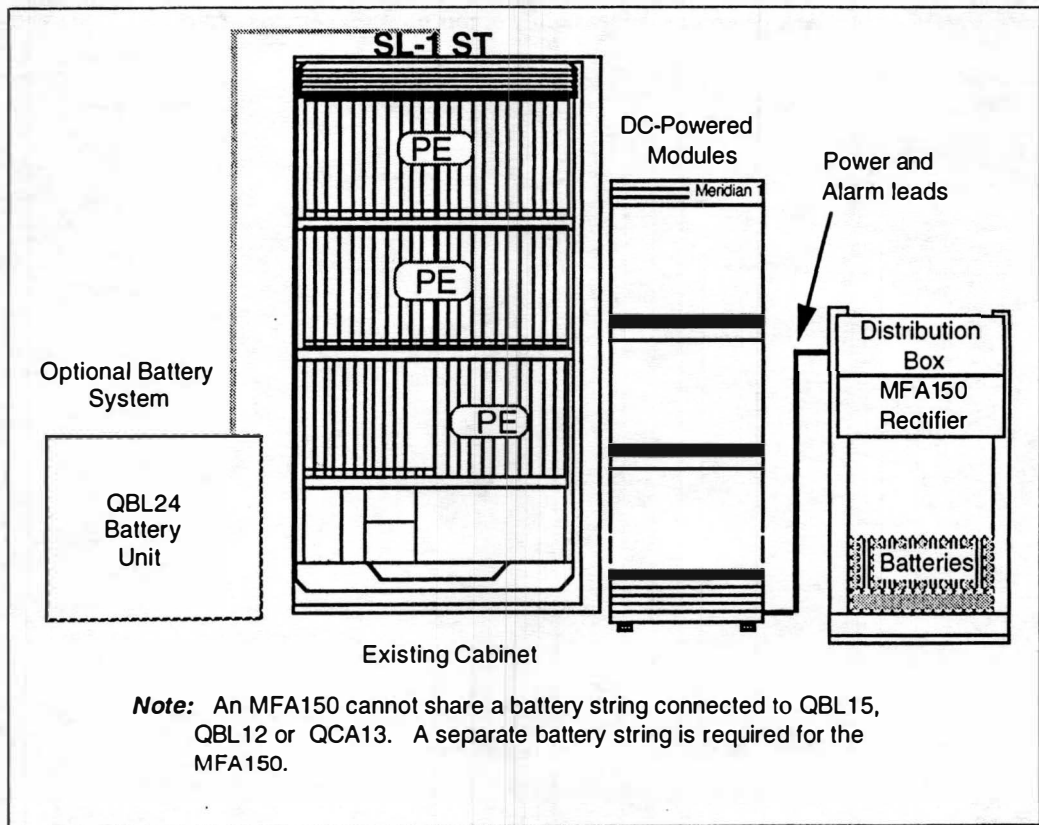
To determine the power requirements for the Option 51C system, refer to 553-3001-152, *Power engineering*. For the existing cabinets, refer to 553-3001-150, *Upgrade Engineering*.

Separate power source

Figure 28-4 illustrates an example of a separate DC power supply arrangement for the upgraded system. Option 51C modules are independently powered using a rectifier module DC power source and the existing cabinet is DC powered using the original power arrangement. No modifications are required to the existing equipment. Power connection information for the MFA150 power system and other power sources to the Option 51C column is contained in 553-3001-210, *System installation procedures*, in the section titled "Installing DC power".

Figure 28-4

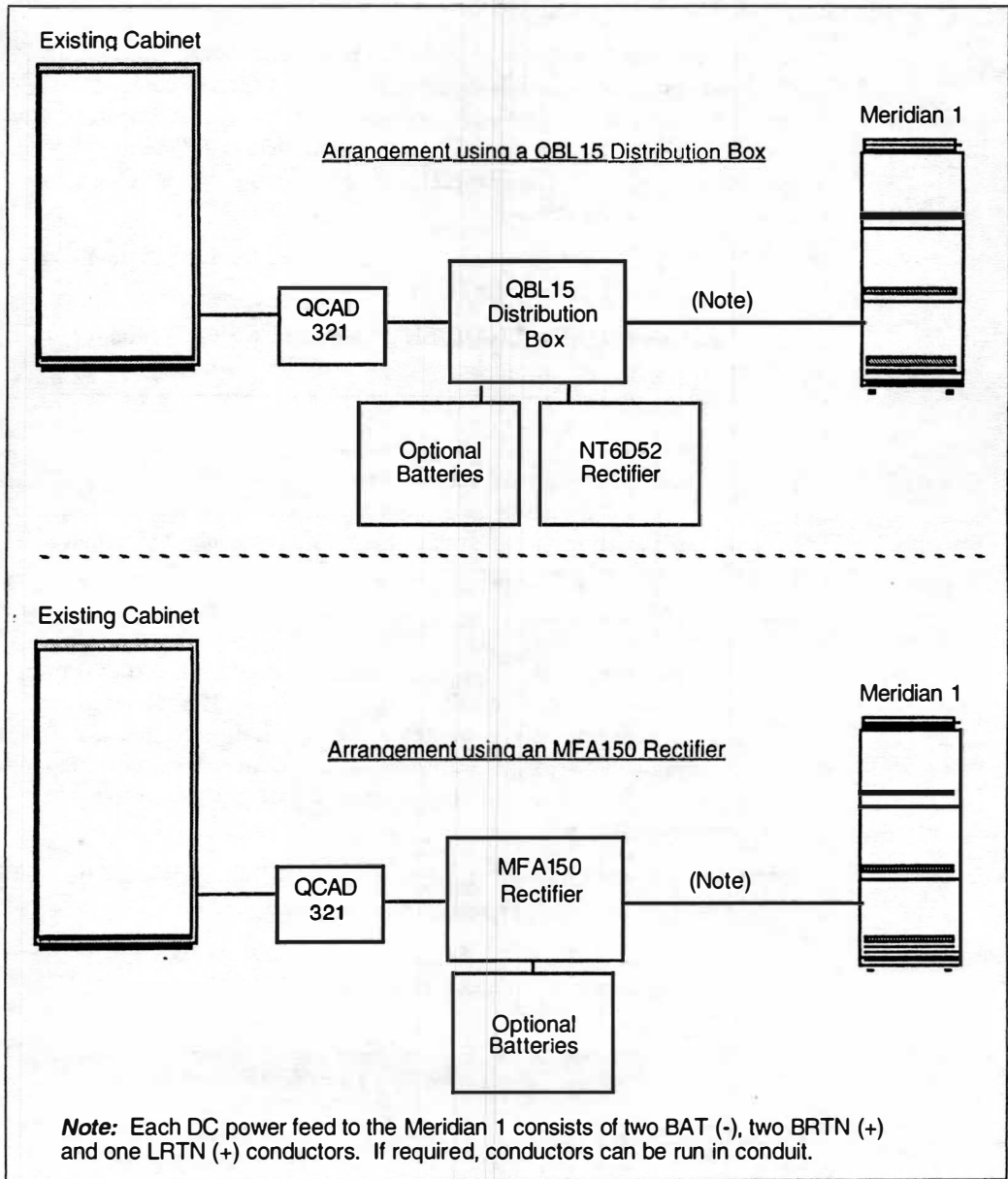
Typical arrangement of independently DC-powered Meridian 1 Option 51C modules



Common power source

Existing cabinet rectifier as a common power source

- For detailed instructions for power source upgrade, refer to 553-3001-150, *Upgrade engineering*. A full description of QBL15 Battery Box installation and connection is contained in 553-3001-210, *System installation procedures, Appendix A: QBL12, QBL15, QCA13*.
- Figure 28-5 illustrates a common power supply arrangement for the upgraded system. This includes both Option 51C modules and the existing cabinet. Option 51C consists of a Core Network module and an IPE module. This configuration may be difficult to power from a single DC power source and load calculations must be made to determine the feasibility of this powering arrangement.

Figure 28-5**Typical arrangement using a common DC power supply with optional battery backup**

Preparing alarm cables

The following procedure describes how to prepare the alarm cables from the Option 51C modules.

These cables connect the System Monitor to the SDI Paddle Board in the Core Network module and the System Monitor to the cross-connect terminal. Refer to the appropriate procedure in 553-3001-210, *System installation procedures* and in 553-3001-210, *System installation procedures, Appendix A* to connect the System Monitor in Meridian 1 systems. Proceed as follows:

- 1 Verify that the NT8D46AG cable is connected from the System Monitor to the SDI Paddle Board.
- 2 Connect the NT8D46BH/DH/EH cable from the System Monitor to the cross-connect terminal.

CAUTION

To avoid service interruptions to the end user, do not cross-connect the alarm cable from the module to the alarm cable from the existing cabinet at this time. It will be connected as part of the cut-over procedure.

- 3 This step applies only if the power for the Meridian 1 modules is from a DC power source separate from the existing cabinets. Refer to the section '**Separate power source**' earlier in this document for a description of a separate DC power source. Connections for other power configurations will be completed at time of cut-over to avoid service interruptions.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150) cable (see Figure 28-9) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
- the QBL15 as described in the Appendix A, 553-3001-210, *Installing and connecting QBL12, QBL15, QCA13*.

Activating and configuring the new system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 51C system:

- 1 Power up and initially load the Option 51C column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.

- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
 - 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
 - 4 The Meridian 1 Option 51C system is now operational.
-

Preparing external network cables

Prepare network cables between the existing cabinet and the Option 51C column.

CAUTION

To avoid service interruptions to the end user, do not connect the network cables to the Peripheral Buffer cards in the existing cabinet at this time. They will be connected as part of the cut-over procedure.

Prepare the cables as follows:

- 1 If EMI regulations apply to the existing cabinet, install the NT9J98 and NT8D73 cable(s) as follows:(see Figure 28-6)
 - Feed the hooded end of the NT9J98 cable(s) through the rear EMI panel of the cabinet.
 - Attach the I/O panel end of the NT9J98 cable(s) to the rear EMI panel (see Figure 28-8).
 - Layout the hooded end of the NT9J98 cable(s) to the DLB card in the cabinet.
 - If two NT9J98 cables are mounted at a single I/O panel opening, attach the support plate provided with the NT9J98 cable using the screws also provided (see Figure 28-9).
 - Connect the NT8D73 cable(s) to the NT9J98 cable(s). Secure the connection with the bail locks on the NT9J98 cable(s).
 - Connect the other end the NT8D73 cable(s) to its assigned connector on the Meridian 1 module. Each loop requires one cable.
- 2 This step applies only if the existing cabinet is not subject to EMI regulations.(see Figure 28-7)
 - Layout a NT8D85 cable between the QPC414 Network Card and the DLB card.

Figure 28-6
Cable types and cable routing — EMI suppression

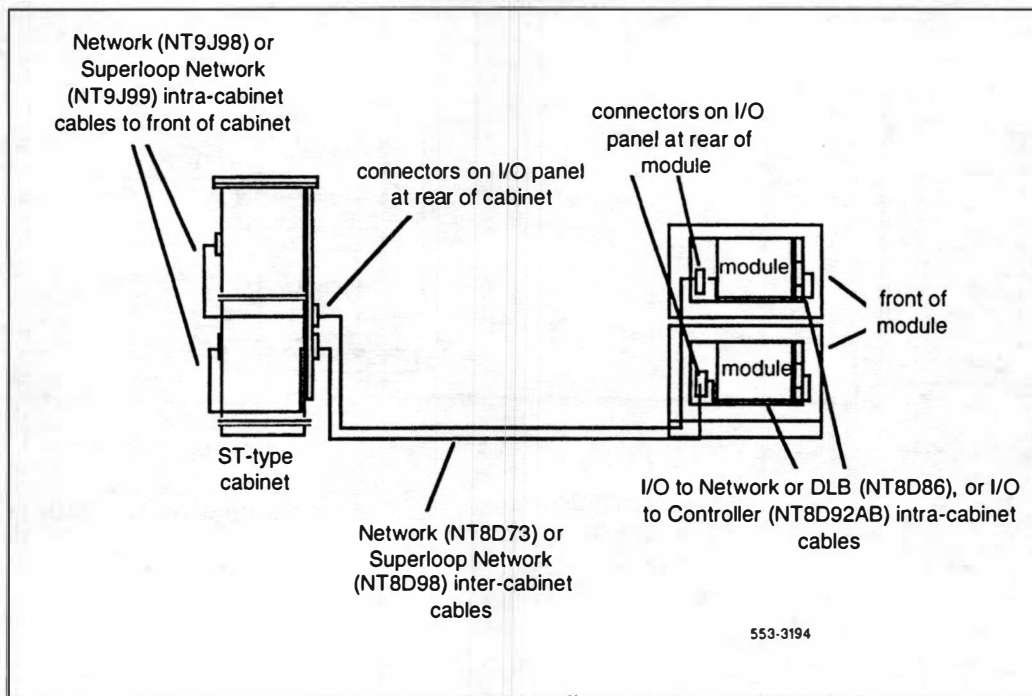


Figure 28-7
Cable types and cable routing — without EMI suppression

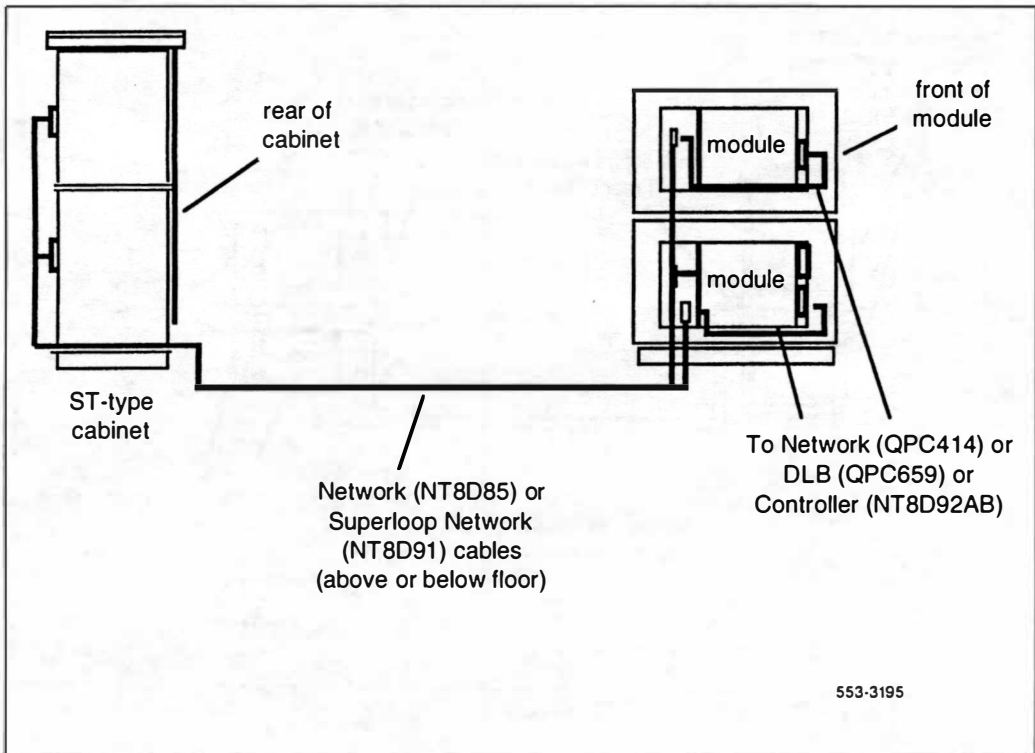


Figure 28-8
Installing NT9J98 cable on EMI panel

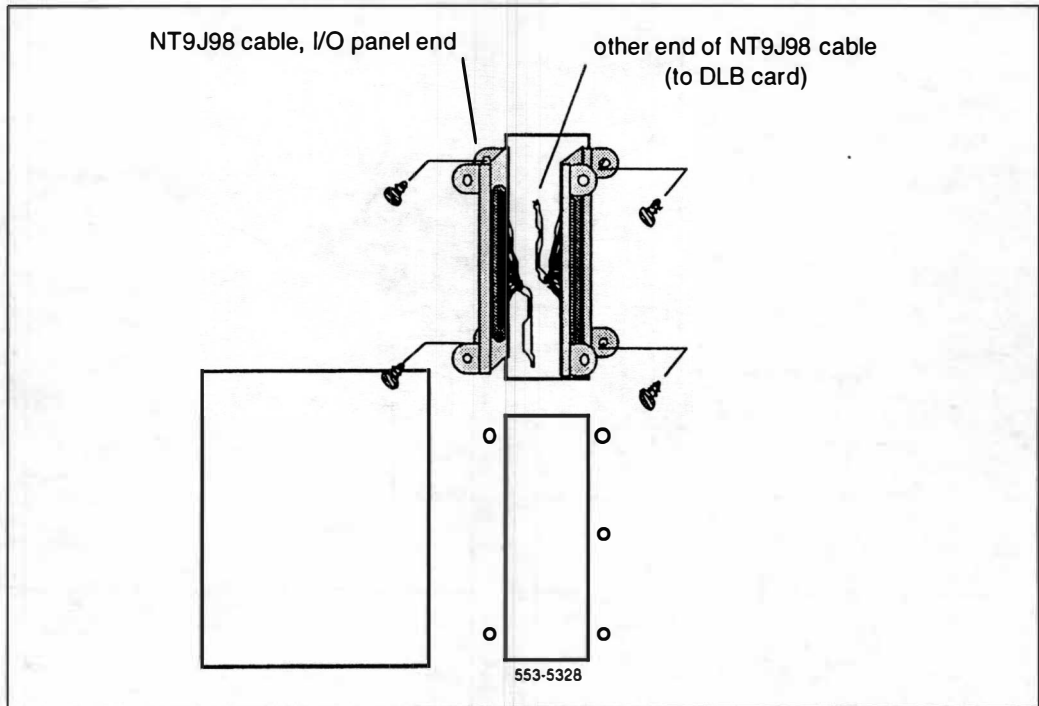
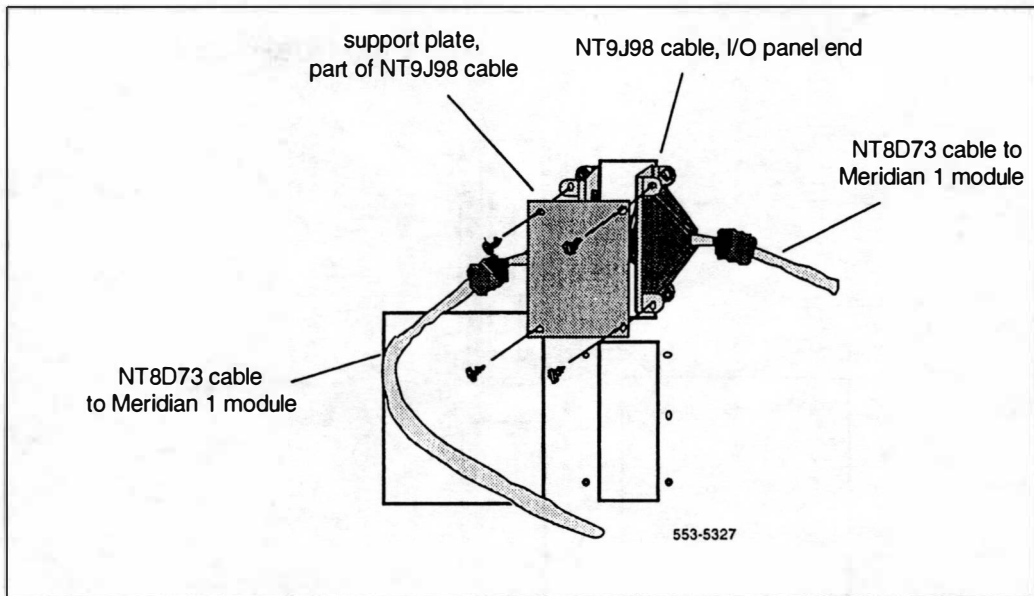


Figure 28-9
Installing NT8D73 cable on EMI panel



Cutting-over

The following procedure describes how to cut-over to the Option 51C system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Interrupt the -48V DC power supply to all cabinets and Meridian 1 columns as follows:
 - **QBL15 unit**
Remove the main fuse or set the main circuit breaker to OFF.
Note: Some QBL15 units are equipped with a main fuse while others are equipped with a circuit breaker.

Set the main circuit breaker of all rectifiers to OFF.
 - **QBL24**
Set the circuit breaker on the battery unit to OFF.
Set the circuit breaker on the rectifier in the QCA141/QCA137 to off
 - **MFA150 unit**
Set the circuit breakers (CB) corresponding to each cabinet and column on the MFA150 unit to OFF. Also set the breakers on the rectifiers associated with the MFA150 to OFF.
- 2 Connect the previously prepared network cables to their assigned Peripheral Buffer or Controller card in the existing cabinet.
- 3 This step applies only to Meridian 1 modules connected to a DC power source.

CAUTION

When a **common** DC power source is used, **do not** connect a TRIP lead to the existing QCA141 or 137 cabinet.

Note: The following cable may have been previously connected if the DC power source is from a source separate from the existing cabinets. See the section "**Preparing alarm cables**" earlier in this document.

Connect the NT8D46AT (for QBL15) or NT8D46AV/BV/CV (for MFA150) cable (see Figure 18-13) from connector J4 to:

- the MFA150 as described in 553-3001-210, *System Installation Procedures*,
or
 - the QBL15 as described in the Appendix A, 553-3001-210, *Installing and connecting*.
- 4 Go to the next procedure and connect the system monitor according to the system configuration. There are three configurations described. They are:
- Configuration 1 — QCA141 cabinet and CE/PE Module
- Configuration 2 — QCA137 cabinet and CE/PE Module
- Configuration 3 — QCA141, QCA137 cabinet and CE/PE Module

Connecting system monitor

The following three procedures describe the method of connecting the system monitor to each of the three possible ST configurations.

Configuration 1

Connecting system monitor SN system with QCA141 and CE/PE Module

The following procedure describes how to connect the system monitor in an SN system equipped with a QCA141 cabinet and a CE/PE Module. The CPU is located in the module.

Note: This procedure requires removing the EMI back panel from the cabinet. If alarm monitor connections to the MDF are not required for remote alarm, CE alarm, SYSIN/SYSOUT or power fail transfer, skip steps 1 through 4 and directly install connector P1 of the NT8D46AX cable into connector J3 of the system monitor, ensuring the connections with a screwdriver.

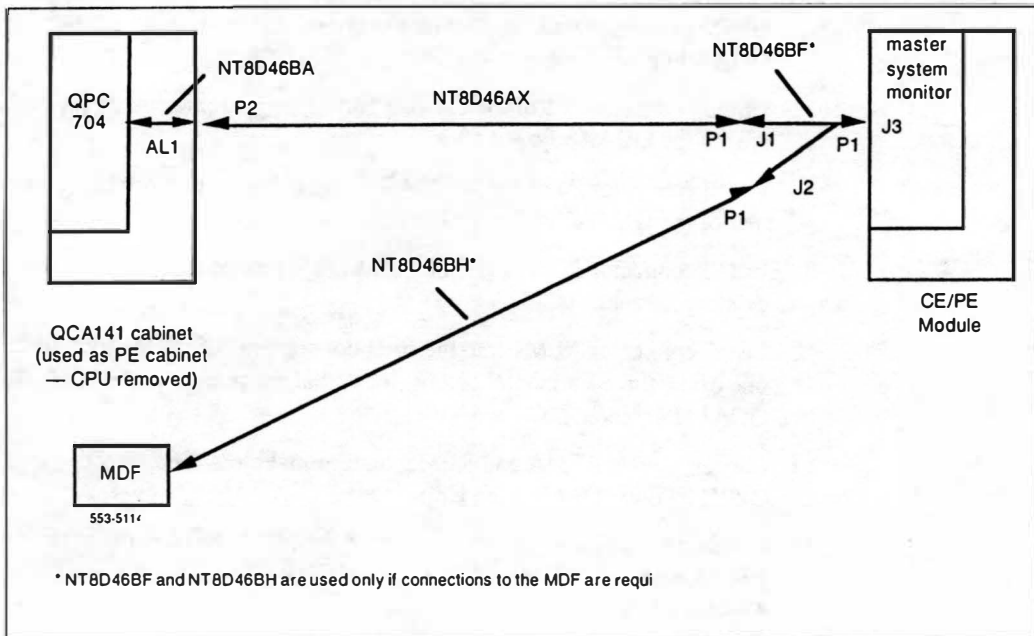
- 1 Install connector P1 of the NT8D46AX cable into connector J1 of the NT8D46BF cable. Ensure the connection with a screwdriver.

- 2 Install connector P1 of the NT8D46BF cable into connector J3 of the system monitor. Ensure the connection with a screwdriver.
- 3 Install connector P1 of the NT8D46BH cable into connector J2 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 4 Terminate the other end of the NT8D46BH cable.
- 5 Remove the QCA141 rear panels.
- 6 Remove the QCA141 EMI back panel. Verify that the GND1 and GND2 cables are tied together on the ground bar at the back of the QUAA3 Power Unit.
- 7 Unplug connector P5 of the existing harness from connector J5 on the rear of the QUAA3 Power Unit.
- 8 Install connector P5 of the NT8D46BA cable into connector J5 on the rear of the QUAA3 Power Unit.
- 9 Install connector J5 of the NT8D46BA cable into connector P5 of the existing harness.
- 10 Install connector ALM1 into the filter connector (P0678258) located in one of the three horizontal cutouts located at the bottom rear of the QCA141 cabinet.
- 11 Loosen screws REMA and REMB on terminal block TB2 of the QUX19 Power Distribution Unit.
- 12 Connect lug REMA (yellow wire) from the NT8D46BA cable to screw REMA on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw REMA.
- 13 Connect lug REMB (black wire) from the NT8D46BA cable to screw REMB on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw REMB.
- 14 Loosen one of the ground lugs located on the ground bar on the rear of the QUAA3 Power Unit with a 7/16" socket driver.
- 15 Connect the GND ring lug (2 black wires) to the loosened ground lug on the rear of the QUAA3 Power Unit and tighten with the socket driver.
- 16 Reinstall the EMI back panel.
- 17 Reinstall the QCA141 rear panels.

- 18 Restore power to the cabinet and column by reinserting the removed fuse and resetting all circuit breakers to on. Verify that all alarm LEDs on the QUAA3 Power Unit are on, except the CE/PE 1 LED which is on after approximately 90 seconds. Verify that the maintenance console displays message:

PWR0055 00 0 0

Figure 28-10
Connecting system monitor — Configuration 1



Fault clearing

After powering up the system and sysloading is complete, wait 90 seconds then verify the following:

- 1 The PFTU (if installed) is not activated.
- 2 All LEDs on the QUAA3 Power Unit stay on. If not, verify that steps 13 through 22 of the installation procedure have been completed.
- 3 The LED on the top cap of the CE/PE Module is off. If not, perform one of the following:
 - unseat the system monitor, verify the switch settings (Table 28-2), and reinstall it into the pedestal
 - use LD37, Input/Output Diagnostic, and issue the command "STAT XSM" to identify the fault. See *X11 input/output guide* (553-3001-400).

To verify the installation, perform the following optional procedure on the CE/PE Module:

- 1 Locate the blower unit inside the pedestal of the CE/PE Module.
- 2 Set the circuit breaker on the blower unit to off. Verify the following:
 - the LED on the top cap is on
 - all LEDs on the QUAA3 Power Unit stay on.
 - the maintenance console displays message:
PWR0006 FANU 00 0 0
- 3 Set the circuit breaker on the blower unit back on. Verify that the LED on the top cap is off, and the maintenance console displays message:
PWR0046 FANU 00 0 0
- 4 Perform a data dump using LD43.
- 5 Perform a sysload on the CE/PE Module. Verify the following:
 - the CE/PE 1 LED on the QUAA3 Power Unit is off
 - the PFTU (if installed) is activated
 - the LED on the top cap of the CE/PE Module is on
 - the LEDs on all ringing generators are off

6 Wait 90 seconds after the sysload, then verify the following:

- the CE/PE 1 LED is on
- the PFTU (if installed) is deactivated
- the LED on the top cap of the CE/PE Module is off
- the LEDs on all ringing generators are on
- the maintenance console displays messages:

PWR0056 PFTU XX X X
PWR0055 XSMC 00 0 0
PWR0000 PWSP XX X X
(for each ringing generator)

To verify the installation, perform the following optional procedure on the QCA141 cabinet:

1 Hardware disable the QPC659 DLB card and verify the following:

- the PE 2-5 LED on the QUAA3 Power Unit is off
- the LED on the top cap of the CE/PE Module is off
- the maintenance console displays message:

PWR0015 XSMC 00 0 0

2 Hardware enable the QPC659 DLB card. Verify that the PE 2-5 LED is on and the maintenance console displays message:

PWR0055 XSMC 00 0 0

If any test fails, verify that the QCAD309A and NT8D46AY cables are installed properly, and the switch settings on the system monitor are correct for this configuration.

Configuration 2

Connecting system monitor with QCA137 and CE/PE Module

The following procedure describes how to connect the system monitor in an ST system equipped with a QCA137 cabinet and a CE/PE Module. The CPU is located in the module.

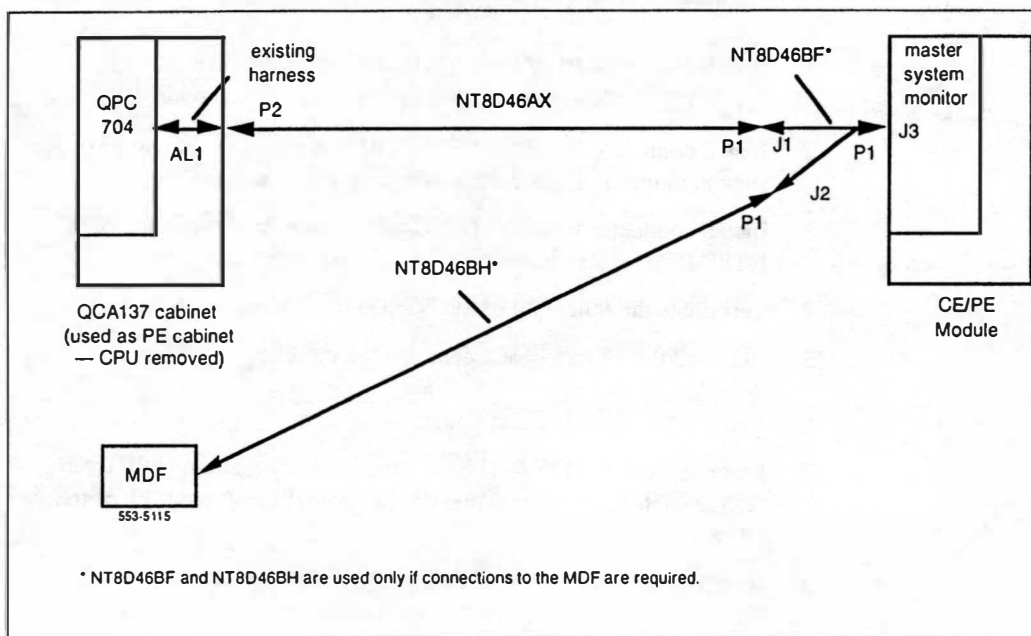
Note: This procedure requires removing the EMI back panel from the cabinet. If alarm monitor connections to the MDF are not required for remote alarm, CE alarm, SYSIN/SYSOUT or power fail transfer, skip steps 1 through 4 and directly install connector P1 of the NT8D46AX cable into connector J3 of the system monitor, ensuring the connections with a screwdriver.

- 1 Install connector P1 of the NT8D46AX cable into connector J1 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 2 Install connector P1 of the NT8D46BF cable into connector J3 of the system monitor. Ensure the connection with a screwdriver.
- 3 Install connector P1 of the NT8D46BH cable into connector J2 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 4 Terminate the other end of the NT8D46BH cable.
- 5 Reinstall the pedestal back panel on the module.
- 6 Remove the QCA137 rear panels.
- 7 Remove the QCA137 EMI back panel. Verify that the GND1 and GND2 cables are tied together on the ground bar at the back of the QUAA3 Power Unit.
- 8 Install connector P2 of the NT8D46AX cable into connector AL1 (P0678258 Filter Connector) at the bottom rear of the QCA137 cabinet. Ensure the connection with a screwdriver.
- 9 Reinstall the EMI back panel.
- 10 Reinstall the QCA137 rear panels.

- 11 Restore power to the cabinet and column by reinserting the removed fuse and resetting all circuit breakers to on. Verify that all alarm LEDs on the QUAA3 Power Unit are on, except the CE/PE 1 LED which is on after approximately 90 seconds. Verify that the maintenance console displays message:

PWR0055 00 0 0

Figure 28-11
Connecting system monitor — Configuration 2



Fault clearing

After powering up the system and sysloading is complete, wait 90 seconds then verify the following:

- 1 The PFTU (if installed) is not activated.
- 2 All LEDs on the QUAA3 Power Unit stay on. If not, verify cable connections.
- 3 The LED on the top cap of the CE/PE Module is off. If not, perform one of the following:
 - unseat the system monitor, verify the switch settings (Table 28-2), and reinstall it into the pedestal
 - use LD37, Input/Output Diagnostic, and issue the command "STAT XSM" to identify the fault. See *X11 input/output guide* (553-3001-400).

To verify the installation, perform the following optional procedure on the CE/PE Module:

- 1 Locate the blower unit inside the pedestal of the CE/PE Module.
- 2 Set the circuit breaker on the blower unit to off. Verify the following:
 - the LED on the top cap is on
 - all LEDs on the QUAA3 Power Unit stay on.
 - the maintenance console displays message:
PWR0006 FANU 00 0 0
- 3 Set the circuit breaker on the blower unit back on. Verify that the LED on the top cap is off and the maintenance console displays message:
PWR0046 FANU 00 0 0
- 4 Perform a data dump using LD43.
- 5 Perform a sysload on the CE/PE Module. Verify the following:
 - the CE/PE 1 LED on the QUAA3 Power Unit is off
 - the PFTU (if installed) is activated
 - the LED on the top cap of the CE/PE Module is on
 - the LEDs on all ringing generators are off

6 Wait 90 seconds after the sysload, then verify the following:

- the CE/PE 1 LED is on
- the PFTU (if installed) is deactivated
- the LED on the top cap of the CE/PE Module is off
- the LEDs on all ringing generators are on
- the maintenance console displays messages:

PWR0056 PFTU XX X X
PWR0055 XSMC 00 0 0
PWR0000 PWSP XX X X
(for each ringing generator)

To verify the installation, perform the following optional procedure on the QCA137 cabinet:

1 Hardware disable the QPC659 DLB card and verify the following:

- the PE 2-5 LED on the QUAA3 Power Unit is off
- the LED on the top cap of the CE/PE Module is off
- the maintenance console displays message:

PWR0015 XSMC 00 0 0

2 Hardware enable the QPC659 DLB card. Verify that the PE 2-5 LED is on, and the maintenance console displays message:

PWR0055 XSMC 00 0 0

If any test fails, verify that the NT8D46AX cable is installed properly, and the switch settings on the system monitor are correct for this configuration.

Configuration 3

Connecting system monitor SN system with QCA141, QCA137, and CE/PE Module

The following procedure describes how to connect the system monitor in an SN system equipped with a QCA141 cabinet, a QCA137 cabinet, and a CE/PE Module. The CPU is located in the module.

Note: This procedure requires removing the EMI back panels from both cabinets. If alarm monitor connections to the MDF are not required for remote alarm, CE alarm, SYSIN/SYSOUT or power fail transfer, skip steps 1 through 4 and directly install connector P1 of the NT8D46BE cable into connector J3 of the system monitor, ensuring the connections with a screwdriver.

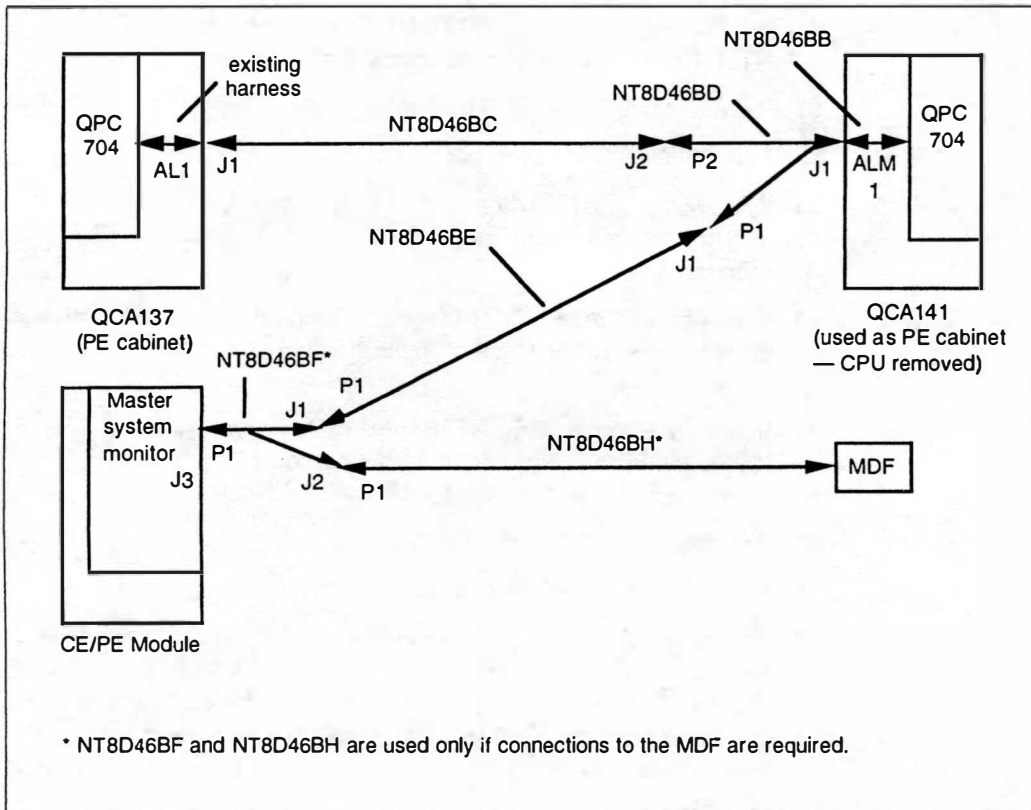
- 1 Install connector P1 of the NT8D46BF cable into connector J3 of the system monitor. Ensure the connection with a screwdriver.
- 2 Install connector P1 of the NT8D46BE cable into connector J1 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 3 Install connector P1 of the NT8D46BH cable into connector J2 of the NT8D46BF cable. Ensure the connection with a screwdriver.
- 4 Terminate the other end of the NT8D46BH cable.
- 5 Reinstall the pedestal back panel.
- 6 Remove the QCA141 rear panels.
- 7 Remove the QCA141 EMI back panel. Verify that the GND1 and GND2 cables are tied together on the ground bar at the back of the QUAA3 Power Unit.
- 8 Unplug connector P6 of the existing harness from connector J6 of the QCAD309 Alarm Cable.
- 9 Unplug connector P6 of the QCAD309 Alarm Cable from connector J6 of the QUAA3 Power Unit.
- 10 Unplug connector P4 of the existing harness from connector J4 of the QCAD309 Alarm Cable.
- 11 Unplug connector P4 of the QCAD309 Alarm Cable from connector J4 of the QUAA3 Power Unit.
- 12 Remove connector AL1 of the QCAD309 Alarm Cable from the P0678258 Filter Connector located in one of the three horizontal cutouts at the bottom rear of the QCA141 cabinet.
- 13 Remove the QCA309 Alarm Cable.
- 14 Remove the NE-25MQA1 Alarm Cable connecting the QCA141 and QCA137 cabinets.

- 15 Unplug connector P5 of the existing harness from connector J5 on the rear of the QUAA3 Power Unit.
- 16 Install connector P5 of the NT8D46BB cable into connector J5 on the rear of the QUAA3 Power Unit.
- 17 Install connector J5 of the NT8D46BB cable into connector P5 of the existing harness.
- 18 Install connector P4 of the existing harness into connector J4 on the rear of the QUAA3 Power Unit.
- 19 Unplug connector P6 of the existing harness from connector J6 on the QUAA3 Power Unit.
- 20 Install connector P6 of the NT8D46BB cable into connector J6 on the QUAA3 Power Unit.
- 21 Install connector J6 of the NT8D46BB cable into connector P6 of the existing harness.
- 22 Loosen screws XCE, REMA, and REMB on terminal block TB2 of the QUX19 Power Distribution Unit.
- 23 Connect lug XCE (white wire) from the NT8D46BB cable to screw XCE on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw XCE.
- 24 Connect lug REMA (yellow wire) from the NT8D46BB cable to screw REMA on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw REMA.
- 25 Connect lug REMB (black wire) from the NT8D46BB cable to screw REMB on terminal block TB2 of the QUX19 Power Distribution Unit. Tighten screw REMB.
- 26 Loosen one of the ground lugs located on the ground bar on the rear of the QUAA3 Power Unit with a 7/16" socket driver.
- 27 Connect the GND ring lug (four black wires) to the loosened ground lug on the rear of the QUAA3 Power Unit and tighten with the socket driver.
- 28 Install connector ALM1 of the NT8D46BB cable into one of the three horizontal cutouts using the existing P0678258 Filter Connector.
- 29 Install connector J1 of the NT8D46BD cable into the P0678258 Filter Connector. Ensure the connection with a screwdriver.

- 30 Install connector J1 of the NT8D46BE cable into connector P1 of the NT8D46BD cable.
- 31 Install connector J2 of the NT8D46BC cable into connector P2 of the NT8D46BD cable. Ensure the connection with a screwdriver.
- 32 Reinstall the QCA141 EMI back panel.
- 33 Reinstall the QCA141 rear panels.
- 34 Remove the QCA137 rear panels. Verify that the QCAD310 cable is installed between the ground bars of the QCA141 and QCA137 cabinets.
- 35 Remove the QCA137 EMI back panel. Verify that the GND1 and GND2 cables are tied together on the ground bar at the back of the QUAA3 Power Unit.
- 36 Install connector J1 of the NT8D46BC cable into connector AL1 (P0678258 Filter Connector) at the bottom rear of the QCA137 cabinet. Ensure the connection with a screwdriver.
- 37 Reinstall the QCA137 EMI back panel.
- 38 Reinstall the QCA137 rear panels.
- 39 Restore power to the cabinet and column by reinserting the removed fuse and resetting all circuit breakers to on. Verify that all alarm LEDs on the QUAA3 Power Unit are on, except the CE/PE 1 LED which is on after approximately 90 seconds. Verify that the maintenance console displays message:

PWR0055 00 0 0

Figure 28-12
Connecting system monitor — Configuration 3



Fault clearing

After powering up the system and sysloading is complete, wait 90 seconds then verify the following:

- 1 The PFTU (if installed) is not activated.
- 2 All LEDs on the QUAA3 Power Units in the QCA141 and QCA137 cabinets stay on. If not, verify that steps 10, 11, and 14 through 33 of the installation procedure have been completed.
- 3 The LED on the top cap of the CE/PE Module is off. If not, perform one of the following:
 - unseat the system monitor, verify the switch settings (Table 28-2), and reinstall it into the pedestal
 - use LD37, Input/Output Diagnostic, and issue the command "STAT XSM" to identify the fault. See *X11 input/output guide* (553-3001-400).

To verify the installation, perform the following optional procedure on the CE/PE Module:

- 1 Locate the blower unit inside the pedestal of the CE/PE Module.
- 2 Set the circuit breaker on the blower unit to off. Verify the following:
 - the LED on the top cap is on,
 - all LEDs on the QUAA3 Power Units of the QCA141 and QCA137 cabinets stay on
 - the maintenance console displays message:
PWR0006 FANU 00 0 0
- 3 Set the circuit breaker on the blower unit back on. Verify that the LED on the top cap is off and the maintenance console displays message:
PWR0046 FANU 00 0 0
- 4 Perform a data dump using LD43.
- 5 Perform a sysload on the CE/PE Module. Verify the following:
 - all CE/PE LEDs are off
 - the PFTU (if installed) is activated
 - the LED on the top cap of the CE/PE Module is on

- the LEDs on all ringing generators are off
- 6 Wait 90 seconds after the sysload, then verify the following:
- all CE/PE 1 LEDs are on
 - the PFTU (if installed) is deactivated
 - the LED on the top cap of the CE/PE Module is off
 - the LEDs on all ringing generators are on
 - the maintenance console displays messages:
PWR0056 PFTU XX X X
PWR0055 XSMC 00 0 0
PWR0000 PWSP XX X X
(for each ringing generator)

To verify the installation, perform the following optional procedure on the QCA141 cabinet:

- 1 Hardware disable the QPC659 DLB card and verify the following:
 - the PE 2-5 LEDs on the QUAA3 Power Units of the QCA141 and QCA137 cabinets stay on
 - the LED on the top cap of the PE Module stays off
 - the maintenance console displays message:
PWR0015 XSMC 00 0 0
- 2 Hardware enable the QPC659 DLB card and verify that the PE 2-5 LEDs on the QUAA3 Power Units of the QCA141 and QCA137 cabinets are on. Verify that the maintenance console displays message:
PWR0055 XSMC 00 0 0

To verify the installation, perform the following optional procedure on the QCA137 cabinet:

1 Hardware disable the QPC659 DLB card and verify the following:

- the PE 2-5 LED on the QUAA3 Power Unit of the QCA137 cabinet is off
- the PE 2-5 LED on the QUAA3 Power Unit of the QCA141 cabinet stays on
- the LED on the top cap of the CE/PE Module stays off
- the maintenance console displays message:

PWR0015 XSMC 00 0 0

2 Hardware enable the QPC659 DLB card and verify that the PE 2-5 LEDs on the QUAA3 Power Units of the QCA141 and QCA137 cabinets are on. Verify that the maintenance console displays message:

PWR0055 XSMC 00 0 0

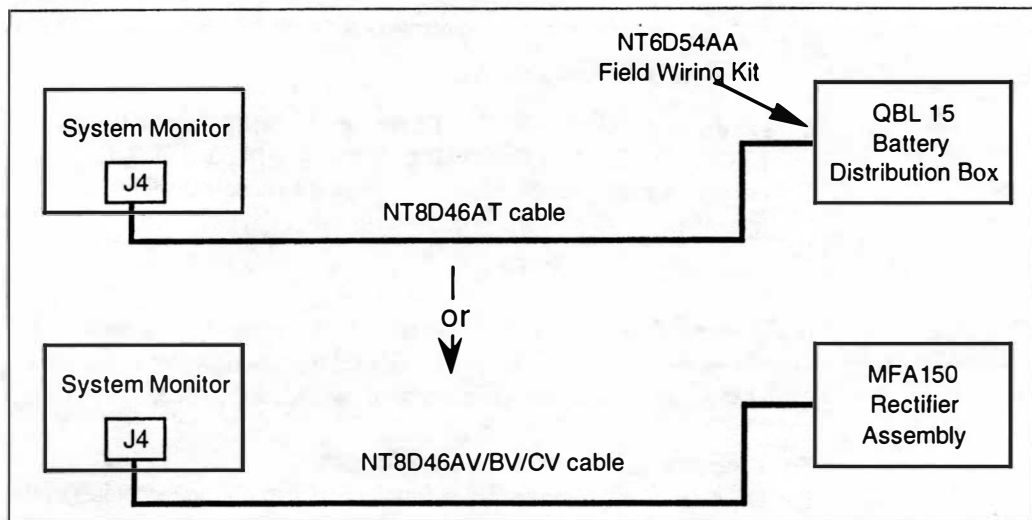
If any test fails, verify that all cables are installed properly, and the switch settings on the system monitor are correct for this configuration. On the QCA137 cabinet, verify the installation of the QCAD310 cable.

To remove equipment no longer required

- 1** Disconnect and remove cables from connectors on the faceplates of the circuit cards located on the CE shelf.
- 2** Remove circuit cards from the CE shelf and store them in a safe place.
- 3** Remove the mass storage unit from the QCA141 cabinet.
- 4** If you are using the CE shelf for DTI/PRI cards:
 - Install DTI/PRI cards in CE shelf card slots 3, 5, 7, 9, and 11.
 - Plan to install at least one DTI/PRI card, as a master card with clock reference, in the Core Network module of the Option 51C upgrade column to obtain the clock reference for the DTI/PRI cards.
 - Set circuit breaker for the CE shelf to ON.

- 5 If you are not going to use the CE shelf for DTI/PRI cards:
 - Install the power load card (NT6D81AA) in the CE shelf card slots 2 through 11.
- 6 Refer to Post-conversion steps found in 553-2001-320 to verify customer data and system operation.

Figure 28-13
NT8D46 cable types



Meridian 1 NT6D39 card cage upgrade to Meridian 1 Option 51C

Upgrading a Meridian 1 Option 51 to an Option 51C

This section describes upgrading a Meridian 1 NT6D39 (Option 51) to an Option 51C. Upgrading requires powering down the Option 51, removing and replacing the CPU/Network card cage with the NT9D11 Core/Network card cage, and installing the release 20 software.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51C:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51C operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 51C is operating with the new software provided with it.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51C operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Terminal and modem connections

During an upgrade, and for continuing system operation, a terminal must be connected to an SDI port in a network slot to provide an I/O interface to the active core in the system. In addition, a data terminal equipment (DTE) and a data communication equipment (DCE) port on each NT6D66 CP Card can be used for direct access to the core module which houses the card.

The ports on the CP card (CPIO ports) are active only when the core associated with the CP card is active. Therefore, the CPIO ports should not be used as the only I/O connection for the system.

When you switch service to a core module during an upgrade, one I/O address is required for a CPIO port:

- If only one address is available, the CPIO port for a terminal connection is automatically assigned to it.
- If more than one address is available, the CPIO port for a terminal connection is automatically assigned to the first available address (the lowest number) and an I/O port for a modem connection is automatically assigned to the next available address.

CAUTION

Always configure the I/O ports so that one is available for the CPIO terminal port. If no address is available, address 15 is automatically replaced by the CPIO port.

- If there is no address available, the device assigned to I/O address 15 is automatically replaced by the CPIO port for a terminal connection.

When the upgrade is complete, you must leave a terminal and/or modem connected to the system. One SDI port in a network slot must be permanently connected to a terminal or modem. On the CPIO ports you can:

- disconnect the ports
- leave terminals connected for local monitoring
- connect modems for remote monitoring

The Black Box ABCDE-Switch, which provides up to four-to-one switching, is available from Northern Telecom as part number A0377992. The switch box can be used to connect the SDI and CPIO ports to a terminal or a modem. If used, one switch box must be used for terminals and one for modems.

Terminal guidelines

At least two terminals are required during an upgrade. You must connect one terminal to a network SDI port and another terminal to each Core/Network Module as it is activated. (Due to the speed of the operating system in Option 51C, personal computers are useful for file capture and manipulation on the CPIO ports.) Terminals connected to the CPIO ports may be installed as follows:

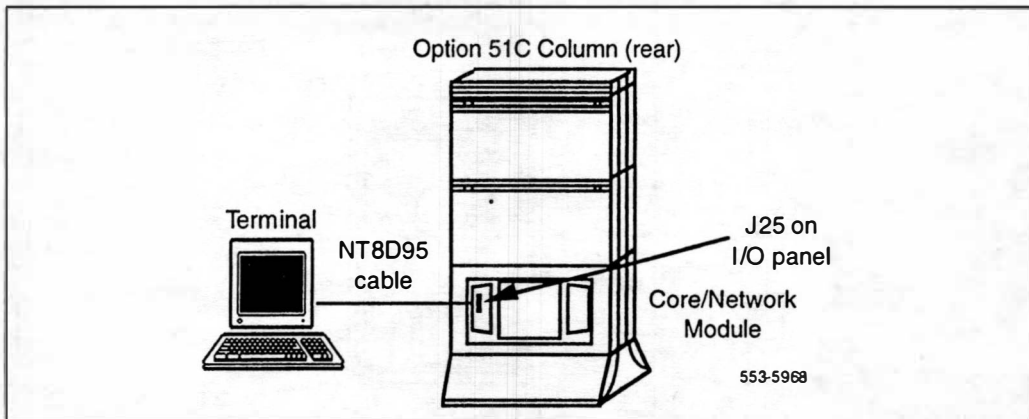
- one terminal connects to a CPIO port in one Core: one terminal is required in addition to the terminal for the SDI port connection (see Figure 33-1)
- one terminal connects to a switch box that connects to a CPIO port in each Core: one terminal and a switch box are required in addition to the terminal for the SDI port connection (see Figure 29-2)
- one terminal connects to a switch box that connects to an SDI port and to a CPIO port in each Core: one terminal and a switch box are required (see Figure 29-3)

Connecting a terminal to a CPIO port

Use the following procedure to connect a CPIO port directly (no switch box) to a terminal (See Figure 29-1):

- 1 Set the terminal to 9600 baud, 7 data, space parity, one stop bit, full duplex, XON.
 - 2 Connect an NT8D95 cable to a matching connector on the terminal.
 - 3 Connect the NT8D95 cable to J25 on the I/O panel in the rear of the Core Module.
 - 4 If you are using only one terminal for both CPIO ports, switch the cable as needed. The terminal connected to the SDI port will always communicate with whichever Core is active.
-

Figure 29-1
One terminal per CPIO port

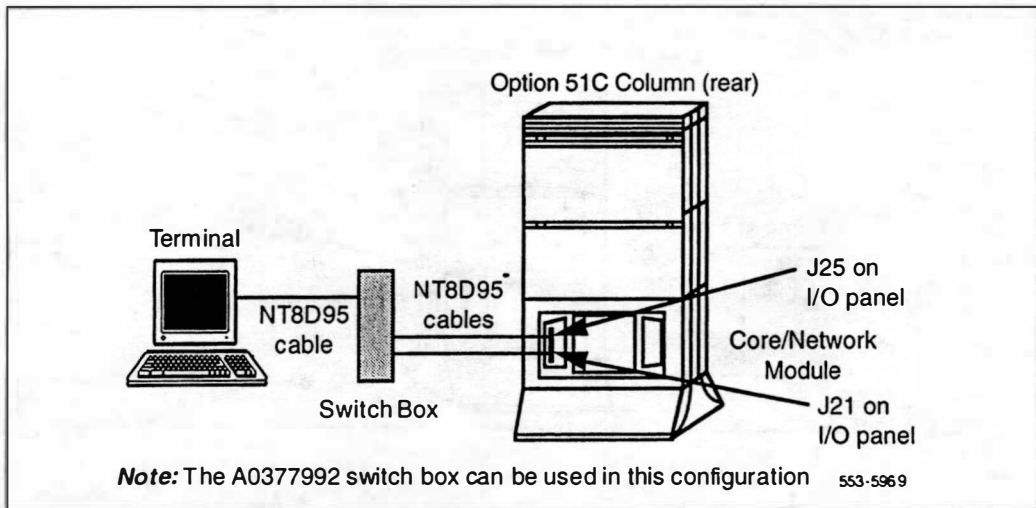


Connecting a switch box and terminal to CPIO ports

Use the following procedure to connect CPIO ports to a switch box and a terminal (see Figure 29-2):

- 1 Set the terminal to 9600 baud, 7 data, space parity, one stop bit, full duplex, XON.
- 2 Connect an NT8D95 cable to the terminal and to the switch box.
- 3 Connect NT8D95 cables to a matching connector on the switch box.
If you are using an A0377992 ABCDE box, connect cables as follows:
 - Connect Core 0 to connector A.
 - Connect Core 1 to connector B.
- 4 Connect the NT8D95 cables from the switch box to J25 on the I/O panel in the rear of the Core Module.
- 5 To communicate directly with a CPIO port, switch the cable as needed. The terminal connected to the SDI port will always communicate with whichever Core is active.

Figure 29-2
One terminal and a switch box to two CPIO ports



Connecting a switch box and terminal to the SDI and CPIO ports

Use the following procedure to connect CPIO ports to a switch box and a terminal (see Figure 29-3):

- 1 Set the terminal to 9600 baud, 7 data, space parity, one stop bit, full duplex, XON.
- 2 Connect an NT8D95 cable to the terminal and to the switch box.
- 3 Connect NT8D95 cables to a matching connector on the switch box.

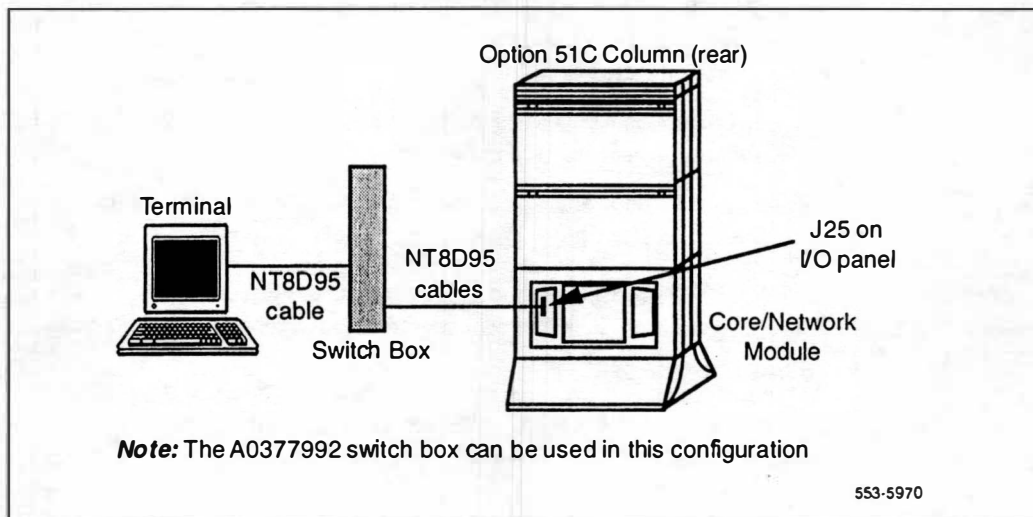
If you are using an A0377992 ABCDE box, connect cables as follows:

- Connect Core 0 to connector A.
 - Connect Core 1 to connector B.
 - Connect the SDI port to connector D (connector C is common).
- 4 Connect NT8D95 cables from the switch box to J25 on the I/O panel in the rear of each Core Module
 - 5 Connect an NT8D95 cable from the switch box to the I/O panel slot for the SDI card.

- 6 To communicate with the system in general, set the switch box to the SDI port. To communicate directly with a CPIO port, switch the cable as needed.

Figure 29-3

One terminal and a switch box to the two CPIO ports and the SDI port



Modem guidelines

You may connect a modem to an SDI port to remotely monitor general system operation. Or you may connect a modem to the CPIO ports for debugging and patch downloading (through your Northern Telecom representative). Or you may want a remote connection to both the SDI and CPIO ports.

At the Meridian 1 end (the local end), modems must be set to dumb mode (command recognition OFF, command echo OFF). Modems at the local end may be connected as follows:

- one modem connects to the SDI port and the cable is switched to each CPIO port as needed (see Figure 29-4)
- one modem connects to a switch box that connects to the SDI and CPIO ports (see Figure 29-5)

Note: The second method listed above is preferred. Other configurations, such as a separate modem for each port, are possible.

At the remote end, at least one modem (which may be set to smart mode), one terminal, and one RS-232 cable are required in all modem configurations.

Modems at the local end must meet the following required specifications to be compatible. Modems that meet the following recommended specifications must also meet the required specifications.

- *Required:* true, not buffered, 9600 baud support (required for remote Northern Telecom technical support)
- *Required:* CCITT V.32 or V.32bis compliance
- *Recommended:* the ability to adjust to lower and higher speeds, depending on line quality, while maintaining 9600 baud at local DTE
- *Recommended:* V.42 error correction
- *Recommended:* V.42bis data compression

A dispatch or call-back modem, normally connected to the SDI port, can be used if it meets the requirements listed above. If you want to use a modem of this type that does not meet the requirements, the modem can only be used in addition to a modem that does meet specifications.

CAUTION

If a Hayes command-set compatible (smart) modem is used at the Meridian 1 end, you *must* select the dumb mode of operation, Command Recognition OFF and Command Echo OFF, before connecting the modem to the SDI port. Refer to the modem instructions to set the mode of operation.

Any modem that meets the required specifications should be compatible with Option 51C. The following models have been tested and verified as compatible:

- Hayes V-series ULTRA Smartmodem 9600
- UDS FastTalk V.32/42b
- US Robotics Courier HST Dual Standard V.32bis

The UDS FastTalk modem is available through Northern Telecom as part number A0381391. The modem is equipped with a 6-ft (1830 mm) power cord for a standard 110 V ac wall socket and a cable that connects to an RJ11C jack. (The A0377992 Black Box ABCDE-Switch can be used with the UDS FastTalk modem.)

Configuring an A0381391 UDS FastTalk modem

Use the following procedure to configure a UDS FastTalk modem.

Note: With the exception of the smart/dumb mode, configuration changes to the modem are made through software. The modem must remain in smart mode (as shipped) until the software configuration is complete.

- 1 Attach a full 25-pin RS232 cable from a terminal to the modem. Set the speed of the terminal to 9600 baud, eight (8) data bits, NO parity and one (1) stop bit. The modem will automatically recognize these settings.
- 2 Issue the following commands to the modem:

Command	Response	Function
AT&F	OK (Note)	Restores factory configuration (reset)
AT&C1	OK (Note)	DCD while carrier present
AT&D2	OK (Note)	Disconnect on drop of DTR
AT&S1	OK (Note)	DSR normal operation
ATS0=1	OK (Note)	Enable autoanswer on first ring
ATS69=0	OK (Note)	DCE = DTE speed
AT%E	OK (Note)	Auto retrain disabled
ATN4	OK (Note)	LAPM mode
AT\QO	OK (Note)	Disable flow control
AT\G	OK (Note)	Disable XON / XOFF
ATX1	OK (Note)	Pass DC1 / DC3
ATY1	OK (Note)	Long space disconnect
ATQ1		Status OFF
ATEO		Turn echo OFF
AT&W0		Write active profile to zero

Note: The modem should return an 'OK' after this command is issued. If an 'OK' is not returned, and you can no longer communicate with the modem, power off the modem and try again.

To verify both the active and stored profile 0, type
AT&V

Based on FASTALK V.32/42b VERSION 1.00 REV D
PROTOCOL VERSION V.42B-SA REV D

the profile should be as follows:

ACTIVE PROFILE DTE SPEED = 9600 BPS
B2 E0 H2 L0 M0 Q1 Q3 V1 X4 Y1 Y3 &C1 &D2 &G0 &J0 &L0 &M0 &P0 &R1 &S1 &T4 &X0
&Y0 %C1 %E0 %F0 \A0 \C0 \D1 \G0 \J1 \K5 \M1 \N4 \Q0 \R0 \V1 \X1 \S00:001 S01:000
S02:043 S03:013 S04:010 S05:008 S06:002 S07:030 S08:002 S09:006 S10:014 S12:050
S14:8AH S16:00H S18:000 S21:FCH S22:70H S23:1DH S25:005 S26:001 S27:00H S29:00H
S30:009 S32:46H S50:00h S52:009 S54:14H S58:000 S60:87H S62:000 S64:000 S69:000

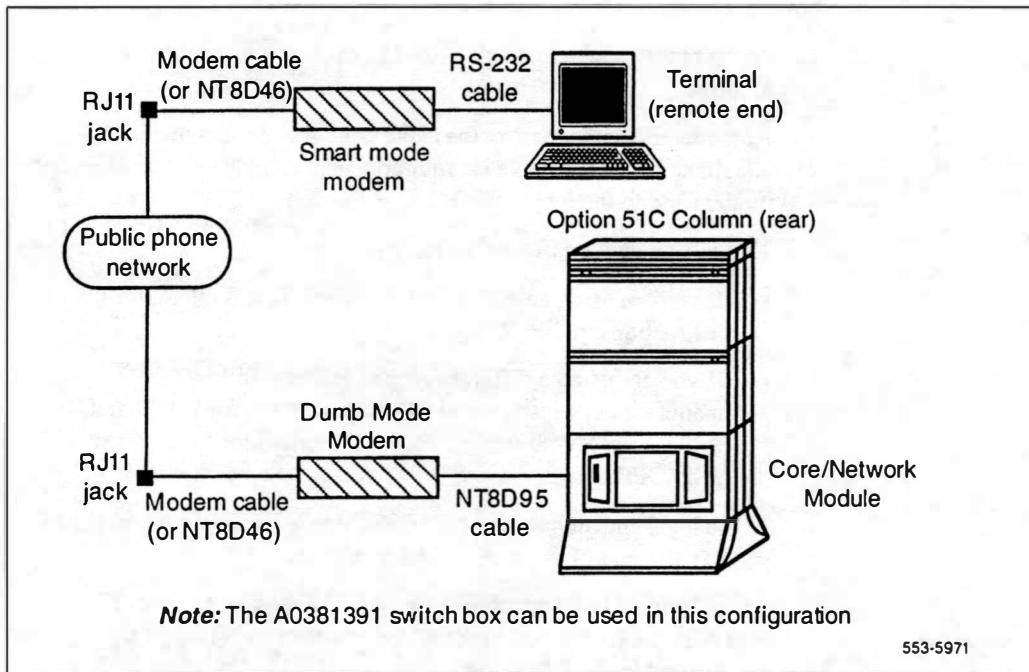
- 4 Remove the top cover on the modem:
 - Stand the unit on its side.
 - Using a medium-size flat screwdriver, lightly pry each lock tab off the latch lock, pulling the cover away from the modem as the lock releases.
 - 5 Set the modem to dumb mode.
This is accomplished through a set of jumpers inside the modem.
 - Viewed from the front of the modem, locate a set of three pins to the left of the modem's speaker. The two pins farthest from the speaker should be factory jumpered.
 - Remove the jumper and place it on the two pins closest to the speaker to set the modem to dumb mode.
 - 6 Replace the cover on the modem:
 - Align the latch locks, the lock tabs, and the rear guide grooves.
 - Press the cover into place until the latch locks engage the lock tabs.
 - 7 Reconnect the power cord and any other cables that will be reused.
-

Connecting a modem to an SDI port

Use the following procedure to connect an SDI port directly (no switch box) to a modem (see Figure 29-4):

- 1 At the remote end, connect an RS-232 cable to the terminal and to the modem.
 - 2 At the remote end, connect the cable from the modem to an RJ11 telephone jack. (If a cable is required, connect an NT8D46 cable to the modem and to the RJ11 jack.)
 - 3 At the local end, configure the modem:
 - If you are using an A0381391 UDS FastTalk modem, follow the instructions in this document.
 - If you are using a different type of modem, follow the manufacturer's instructions to set the modem for 9600 baud, autoanswer, dumb mode, command recognition OFF, command echo OFF.
 - 4 At the local end, connect an NT8D95 cable to the SDI port on the I/O panel in the rear of the module and to the modem.
 - 5 At the local end, connect the cable from the modem to an RJ11 telephone jack. (If a cable is required, connect an NT8D46 cable to the modem and to the RJ11 jack.)
 - 6 To communicate with a CPIO port instead of the SDI port, temporarily switch the cable from the modem to the CPIO port:
 - For debugging or monitoring, connect the cable to the *active* Core at J21 on the I/O panel in the rear of the Core Module.
 - For patch downloading, connect the cable to the *active* Core at J21 on the I/O panel in the rear of the Core Module.
-

Figure 29-4
Modem to SDI port



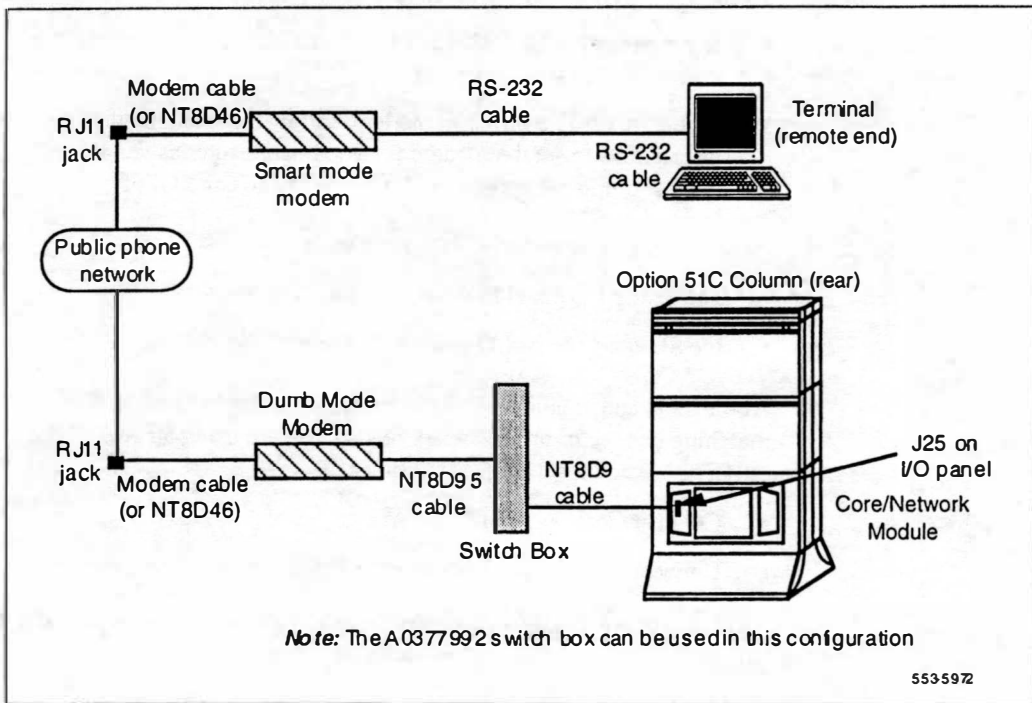
Connecting a modem to a switch box and CPIO and SDI ports

Use the following procedure to connect SDI and CPIO ports to a switch box and a modem (see Figure 29-5):

- 1 At the remote end, connect an RS-232 cable to the terminal and to the modem.
- 2 At the remote end, connect the cable from the modem to an RJ11 telephone jack. (If a cable is required, connect an NT8D46 cable to the modem and to the RJ11 jack.)
- 3 At the local end, configure the modem:
 - If you are using an A0381391 UDS FastTalk modem, follow the instructions in this document.
 - If you are using a different modem, follow the manufacturer's instructions to set the modem for 9600 baud, autoanswer, dumb mode, command recognition OFF, command echo OFF.
- 4 At the local end, connect NT8D95 cables to:
 - J21 on the I/O panel in the rear of the Core Module
 - the SDI port on the I/O panel in the rear of the module
- 5 At the local end, connect NT8D95 cables from the I/O panels to a matching connector on the switch box. If you are using an A0377992 ABCDE box, connect cables as follows:
 - Connect Core 0 to connector A.
 - Connect the SDI port to connector D (connector C is common)
- 6 At the local end, connect an NT8D95 cable from the switch box to the modem.
- 7 At the local end, connect the cable from the modem to an RJ11 telephone jack. (If a cable is required, connect an NT8D46 cable to the modem and to the RJ11 jack.)

- 8 At the local end, set the switch box as needed to communicate with the CPIO ports:
 - During normal operation, set the switch to the SDI port.
 - For debugging, set the switch to the *active* Core.
 - For patch downloading, set the switch to the *active* Core.

Figure 29-5
Modem to a switch box and SDI and CPIO ports



Core Module backplane connections

Core Module backplanes, like all circuit boards, have a primary side and a secondary side. The primary side, which faces the front of the module, contains the primary shrouds which provide mechanical guidance for the pins of the card edge connectors. The secondary side of the backplane, which faces the rear of the module, contains the secondary shrouds which provide mechanical guidance for cable connectors.

The columns of secondary backplane shrouds are designated 18 through 8 from left to right (facing the rear of the backplane). This numbering matches the card slots in the front of the module. The rows of connectors on the secondary backplane shrouds are designated A through F from top to bottom.

Before you connect cables to the backplane, visually inspect the secondary shroud connectors to make sure there are no bent pins. To connect cables:

- 1 Orient the cable connector so the strain relief paddle is to the right.
- 2 Partially insert the cable connector so its guides mate to the corresponding backplane connector.
- 3 Apply a small amount of pressure to push the cable connector straight into the backplane connector. You will feel a distinct click when the connector seats.

CAUTION

Pins may be bent or broken if you try to insert the cable connector at an angle. Do not push the connector in any further after you hear the distinct click.

Core Module extraction tool

To disconnect a cable from the Core Module backplane, use the P0741489 Extraction Tool provided in the rear of the module (behind the I/O safety panel).

CAUTION

You must use the extraction tool to disconnect cables from the backplane in NT9D11 Core/Network Module to avoid bending or breaking backplane pins.

Follow the procedure below to remove cable connectors from the backplane. Use extreme caution to avoid bending or breaking backplane pins. Do not insert the extraction tool unless the cable connector is locked into the securing clip; a gentle tug on the cable will allow you to determine whether or not the connector is secured. Do not force the extraction tool deeper than the tab on side of the cable connector hood.

- 1 Grasp the cable connector by the strain relief tab.
- 2 Center the longer flat edge on the angled end of the tool between the cable connector and the wall of the shroud on the right side of the cable connector.

Note: If the straight end of the tool is notched, use that end if the connector can be accessed straight-on. If you must angle the tool at all, use the angled end.

- 3 *Gently* insert the extraction tool and gradually apply pressure while gently rocking the cable connector up and down.
 - 4 Stop applying pressure as soon as the cable connector comes loose from the shroud.
 - 5 Slowly remove the extraction tool and the cable connector.
-

Equipment required

Table 29-1 lists minimum hardware requirements needed for a card cage level upgrade to a Meridian 1 Option 51C.

Additional equipment may also be needed to meet site requirements. Verify that all equipment needed for the upgrade has been identified.

Table 29-1

Minimum hardware requirements for a Meridian 1 Option 51C

Quantity	Part Number	Description
1	NT1R90AB	Field Upgrade Kit
1	NT6D6003	Core Bus Terminator (CBT)
1	NT6D63AA	I/O Processor (I/O) Card
1	NT6D64AA	Core Multi-Drive Unit (CMDU)
1	NT6D65AA	Core Network Interface (CNI) Pack
1	NT6D66AA	Call Processor (CP) Pack
1	NT8D80AZ	CMA to CMA, 5 ft (1520 mm)
1	NT9D1103	Core Network Card Cage (CPNET)
1	NTND11BA	CP to CP Cable
1	NTND13BC	CMDU to CMDU cable 6 ft (1830 mm)
1	QPC441F	3 Port Extender Card
1	QPC477-9A	Bus Terminating Unit
1	QPC477-10B	Bus Terminating Unit

Note: The vintages shown on circuit cards in Table 29-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

Upgrade preparation

CAUTION

Read through the entire procedure before you begin this upgrade. Perform a thorough audit on the existing system to verify the suitability of the upgrade package and to resolve any existing operational problems, error messages, etc.

The following summarizes the steps you must perform before beginning the upgrade:

- 1 Check equipment required for the upgrade.
- 2 Prepare cables for the installation.
- 3 Replace QPC471 Clock Controller Cards if they are not vintage H or later (does not apply to QPC775 cards).
- 4 Check the contents of the upgrade package, including all circuit cards and cables. Make sure all of the items on the order form are on the packing slip that comes with the equipment.
- 5 Check the cards that you will be reusing to ensure that they can be used in the Option 51C.
- 6 Separate the cables in the upgrade package. Label both ends of all cables.
- 7 If they are not already labeled, label both ends of the existing cables to the clock controller cards in CPU 0.
- 8 If QPC471 Clock Controller Cards in the Option 51C are not minimum vintage H, you must replace them before the upgrade. (This requirement does not apply to QPC775 Clock Controller Cards.)

- 9 The customer database on the Option 51 must be at least release 17 before it can be converted to release 19 on the Option 51C. To convert the database on the Option 51 from release 15 or 16 to release 17, perform the software procedure for converting a database to a higher release located in Software conversion procedures (553-2001-320).

Note: If the database media is a 3.5-in. 2 or 4 Mbyte floppy disk, it can be installed directly into a CMDU and converted to release 19 software later in the upgrade.

- 10 Follow Procedure 1: Pre-conversion procedure, Software conversion procedures (553-2001-320) and print configuration records:

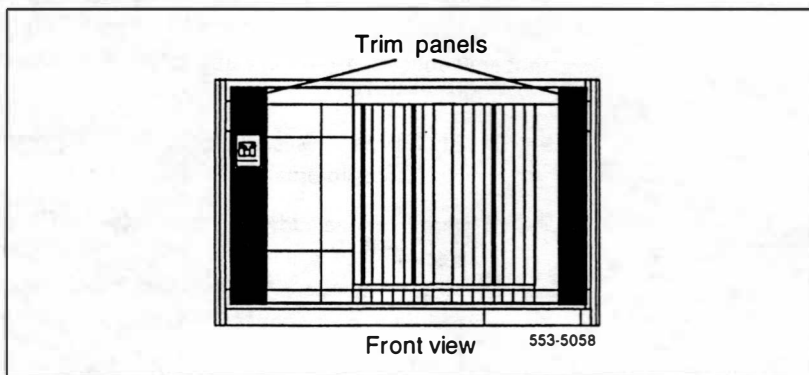
Check the configuration record printouts to identify all configured I/O ports. When you switch service to Core/Network Module, one I/O address should be available for a CPIO port. Refer to "Terminal and modem connections" for specific information regarding the terminal and modem settings.

- If only one address is available, the CPIO port for a terminal connection is automatically assigned to it.
 - If more than one address is available, the CPIO port for a terminal connection is automatically assigned to the first available address (the lowest number). If more than one address is available, the I/O port for a modem connection is also assigned automatically.
 - If there is no address available, the device assigned to I/O address 15 is automatically replaced by the CPIO port for a terminal connection
-

Installing the card cage

- 1 Perform the appropriate step below to turn off power to the column:
 - For AC-powered systems, set the main circuit breaker for the column to OFF (down) in the rear of the pedestal.
 - For DC-powered systems, set the switch on each NT6D41 CE Power Supply to OFF (down). Set the circuit breaker for the module to OFF (down) in the rear of the pedestal.
- 2 Remove the trim panels on both sides of the module (see Figure 29-6). Keep the screws for reuse.

Figure 29-6
Location of trim panels



- 3 Tag and disconnect all cables connected to the front of each card in each CPU/Network module. Note the exact positions of the cables connected to cards on the network side of the card cage. They must connect to the same card when the switch is reassembled. Tape over the contacts to avoid grounding. Tape or tie all cables to the sides so the working area in front of the card cage is totally clear.
- 4 On all cards with an ENB/DIS switch on the faceplate, set the switch to DIS.
- 5 On each card cage, remove the three mounting screws that secure the front of the card cage to the bottom of the module. Keep the screws for reuse.

CAUTION

It may be necessary to temporarily remove some of the cards to get to the three mounting screws. Be sure to replace these cards back into exactly the same slots after the screws have been removed.

- 6 Tag and disconnect cables from the I/O panels. Remove the I/O safety panel that covers the rear of the backplane.
- 7 Tag and disconnect the system monitor ribbon cables to J1 and J2.
- 8 On each card cage, remove the two mounting screws that secure the rear of the card cage to the module. Keep the screws for reuse. (A 1/4" socket wrench is needed for this operation.)

CAUTION

Be careful not to drop any of the screws, nuts, or washers that you remove. Parts that fall down into the blower assembly are difficult to retrieve, and could cause premature failure of the blower assembly.

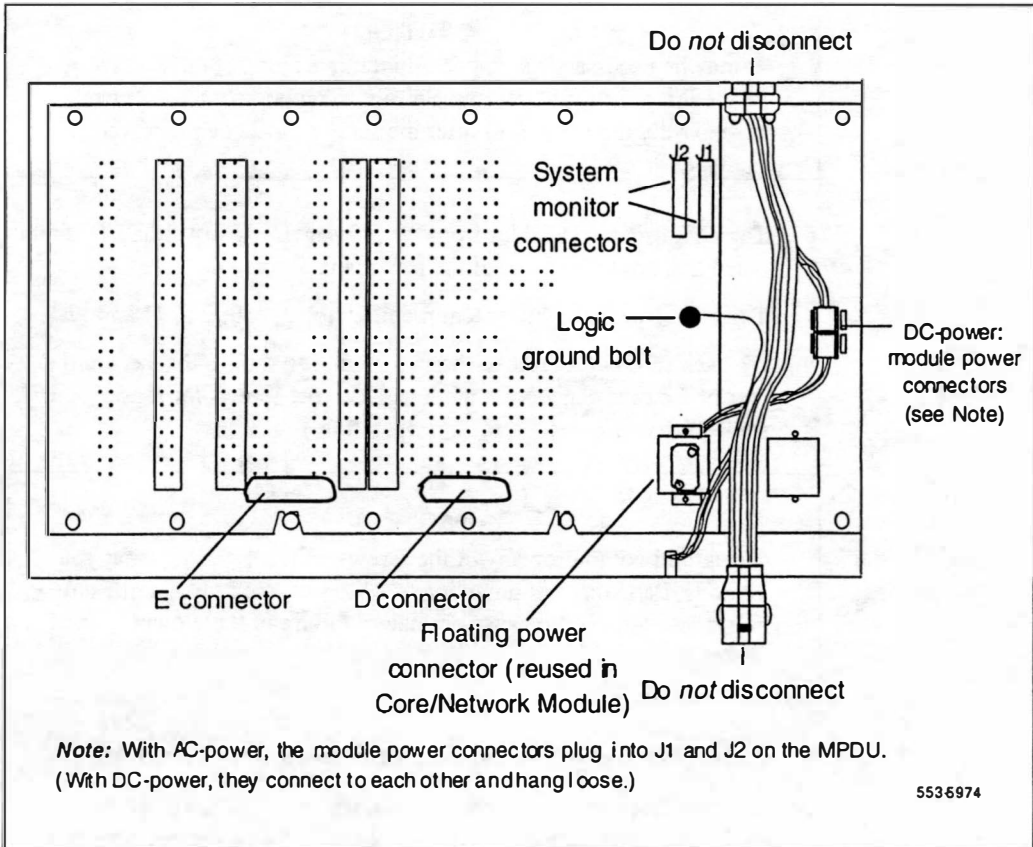
- 9 Pull each card cage forward until it is half-way out of the module.
- 10 Working from the rear of the module, tag and disconnect the two cables that connect the "D" and "E" connectors on the bottom of CPU/Network 0 (see Figure 29-7).

WARNING

Do not disconnect the main power connectors (large orange connectors) at the top and bottom of the module

- 11 Remove the logic ground (orange) wire from the backplane bolt. Be careful; do not drop the nut or lock washer into the pedestal.

Figure 29-7
Power connectors on the rear of the CPU Module backplanes

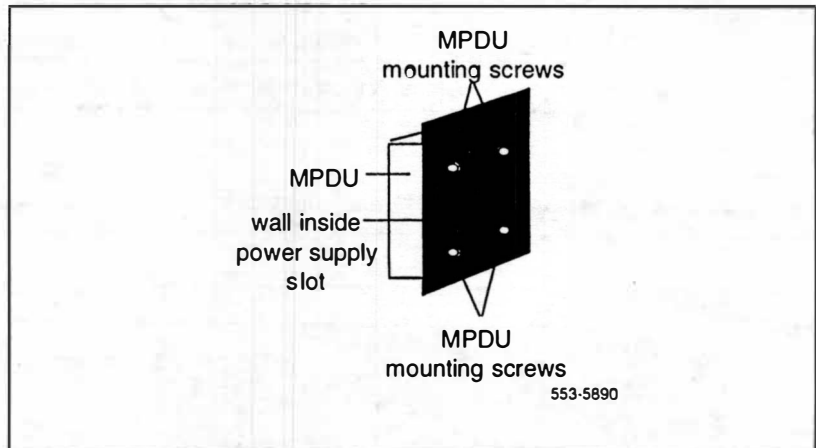


- 12 Tag and disconnect the module power connectors. These are small orange connectors plugged into the module power distribution unit (MPDU) with AC power, or connected to each other with DC power.
- 13 Remove the CPU card cage from the module.

Note: For AC-powered systems: If the new Core/Network module did not come with a Module Power Distribution Unit (MPDU), you must remove the MPDU from each CPU/Network card cage and reinstall it on the new Core/Network card cage after the CPU/Network card cage is out of the module. The screw-heads for the MPDU are in the wall of the power supply slot (see Figure 29-8).

Figure 29-8

Location of the screws for the Module Power Distribution Unit (MPDU)



- 14 If a new floating power connector was not included in the upgrade kit, you should remove the existing floating power connector (the black connector) from the rear of each CPU card cage. Using the same mounting screws and nuts, attach the connectors to the Core/Network card cage.

Note: Check the orientation of the connector. Looking at it from the rear of the card cage, the upper left corner pin should be empty (no wire) and the lower right corner pin should have a wire installed. The green wire should be up.

- 15 Check the backplane jumpers in the Core/Network card cage to identify Core 0 or Core 1 (see Table 29-2). The jumpers are located on the bottom, front of the backplane behind slot 14 (see Figure 29-9).

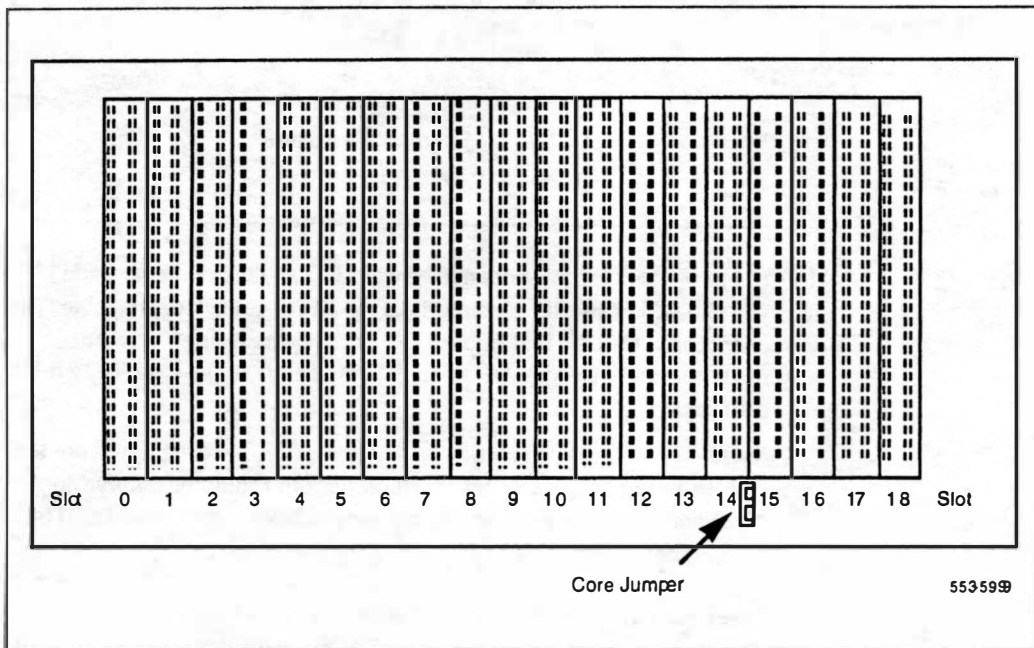
CAUTION

If the core module jumpers are set incorrectly, the system will not load and operate correctly.

Table 29-2
Backplane jumper settings for NT9D11 Core/Network Module

Core	Jumper	Position in Column
Core 0	Jumper plug installed	Lower position

Figure 29-9
Location of the jumper on the NT9D11 backplane



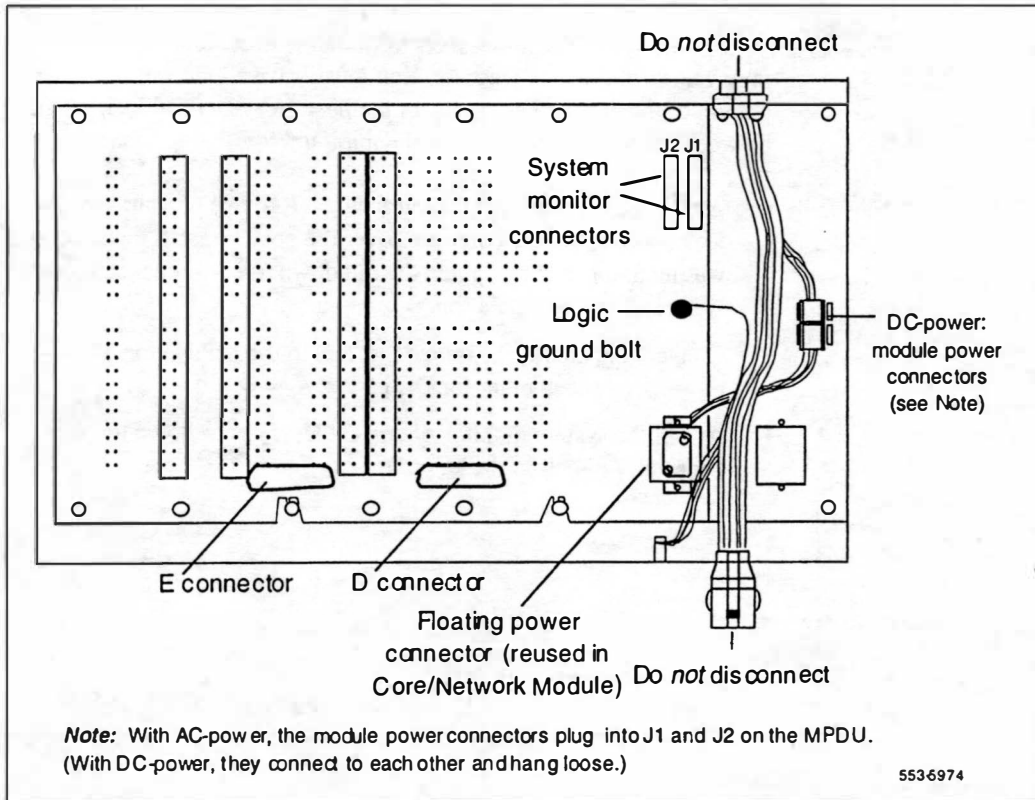
- 16 Reposition the EMI shield (it looks like a brass grill) in the base of each module. Tape over the front mounting tabs to hold the shield in position. The tape will be removed later.
- 17 Slide the Core 0 card cage about half-way into the lower module. Hold the card cage firmly while attaching the power system connectors to the rear of the module (see Figure 29-10):
 - Attach the new frame ground (green) wire to the frame ground post in each module. (A 5/16" socket wrench is needed for this operation.) Remove the nut and the lock washer at the top of the

post. Put the frame ground connector over the post. Reinstall the top lock washer and the nut, then tighten the nut down.

Note: For all of the lugwashers to fit on the post, you need to remove one of the lock washers. You must leave a lock washer at the bottom of the post and at the top of the post. Leave a third lock washer between the second and third, or the third and fourth, lugwashers.

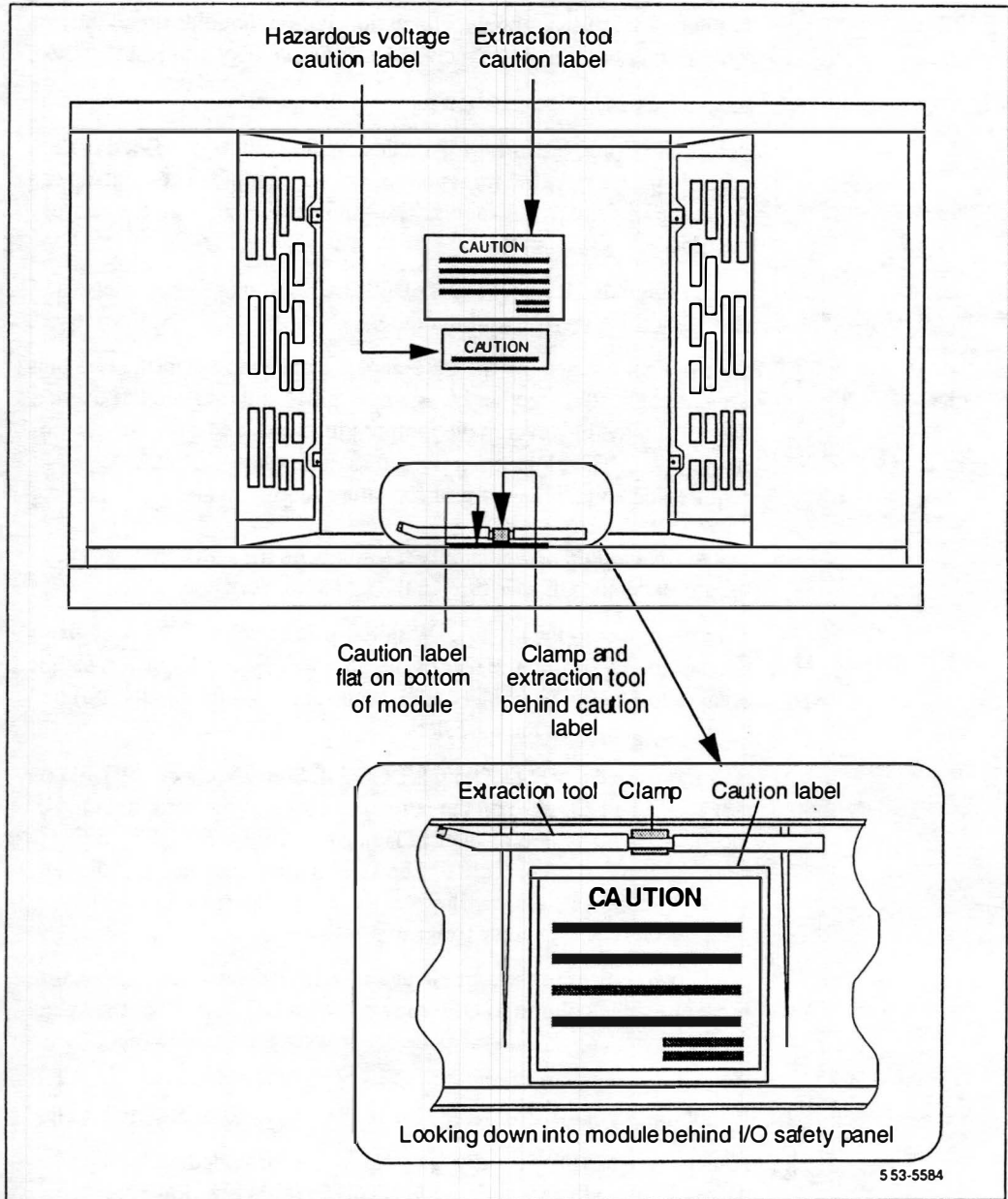
- Attach the logic ground (orange) wires. Remove one nut and the lock washer. Put the connector over the post, reinstall the lock washer and nut, then tighten the nut down. (A 3/8" socket wrench is needed for this operation.)
- Connect the module power connectors to the MPDU for AC power, or to each other for DC power.
- Attach the system monitor ribbon cables. J1 goes down to the pedestal, J2 goes up the column.

Figure 29-10
Power connectors on the rear of the NT9D11 Core/Network Module



- 18 Install the Bus Terminator Units (BTUs), provided in the upgrade package, in the Core/Network card cage. The components must be on the right (looking at the front of the card cage):
 - Install QPC477A9 between slots 0 and 1.
 - Install QPC477B10 between slots 1 and 2.
- 19 On the outside of the I/O safety panel, attach one extraction tool caution label above the "CAUTION hazardous voltage" label (see Figure 29-11).

Figure 29-11
Positioning the extraction tool and caution labels



- 20 In the bottom of the module, attach the other extraction tool caution label directly behind the position of the I/O safety panel.
- 21 In the bottom of the module, attach the clamp that holds the extraction tool directly behind the extraction tool caution label you just installed.
- 22 Snap the P0741489 extraction tool into the clamp.
- 23 Attach the Core/Network Module designation labels, provided in the upgrade package, at the front and rear of the module. These labels can go on top of the existing labels. The smaller label goes on the rear of the module.
- 24 If your upgrade kit includes NT6D6003 CBT Cards, install them in slot 13 of the Core/Network module.

Note: All jumpers on the CBT card are preset to open (the two pins are not connected together by a jumper plug) and must be left open. The card may, however, have jumper plugs installed over one pin on the jumpers. The plugs are provided as extra plugs that may be required on some other card or for future requirements.

- 25 Install the module power supply (reused from the CPU card cage) in the slot labeled "CE pwr sup" in the Core/Network card cage.
- 26 Turn on power to the module. With AC power, set the main circuit breaker to ON (up) in the rear of the pedestal. With DC power, set the breaker to ON (up) in the pedestal, then set the switch to ON (up) on the power supply in the module.
- 27 If you installed a NT6D6003 CBT Card in Step 28, check the LED on that card (the LEDs are on the component side of the card, not on the faceplate). The pattern of the LEDs must be OFF-OFF-OFF-OFF, from the top down, for Core 0. The LED pattern matches the jumper settings on the backplanes. If either pattern is incorrect, check the jumpers on that backplane (refer to Table 29-3).
- 28 Shut down power to the module again. With AC power, set the main breaker for the column to OFF (down). With DC power, set the switch on the power supply and the pedestal breaker for the module to OFF (down).
- 29 Install the NT6D64 CMDU in slot 18. Set the ENB/DIS switch to DIS.
- 30 Attach the QMM42 Security Data Cartridge (provided with the software upgrade package) to the NT6D63 IOP Card. Plug the

cartridge into the connectors on the card and install the screw that secures the cartridge. Place the IOP card in slots 16 and 17 (the card occupies two slots). Set the front panel ENB/DIS switch to DIS.

- 31 Set the Norm/Maint switch to Maint on the NT6D66 CP Card. Place the CP Card in slots 14 and 15 (the card occupies two slots).
- 32 Place the NT6D65 CNI Card in slot 12. Set the front panel ENB/DIS switch to DIS.
- 33 Check the vintage of the QPC441 3PE Card—it must be minimum vintage F. Set the front panel ENB/DIS switch to DIS. Set the option switches and jumper on the card (see Table 29-3). Place the card in slot 11.

Table 29-3
QPC441F 3PE Card—option settings

Core/Network Module							
1	2	3	4	5	6	7	8
off	on	on	off	on	on	on	on
RN27 jumper at E35:							
NT6D11 Core Network Module and NT6D60 Core Module				Set to A			
All other modules				Set to B			

CAUTION

Leave the ENB/DIS switch on the 3PE cards set to ENB. If the cards are disabled, the system will initialize

- 34 Place the QPC43 PS card in slot 10. Set the front panel ENB/DIS switch to DIS.
- 35 Set the option switches on the QPC471 Clock Controller card as shown in Table 29-4. Set the front panel ENB/DIS switch to DIS. Place the clock controller card in slot 9.

Table 29-4
QPC471 Clock Controller Card switch settings

Switch	1	2	3	4
SW1	On	On	On	On
SW2	Off	Off	Off	Off
SW4	Off	On	Off	Off

- 36 Remove the network cards from the old CPU card cage and reinstall them into exactly the same position on the new Core/Network card cage.

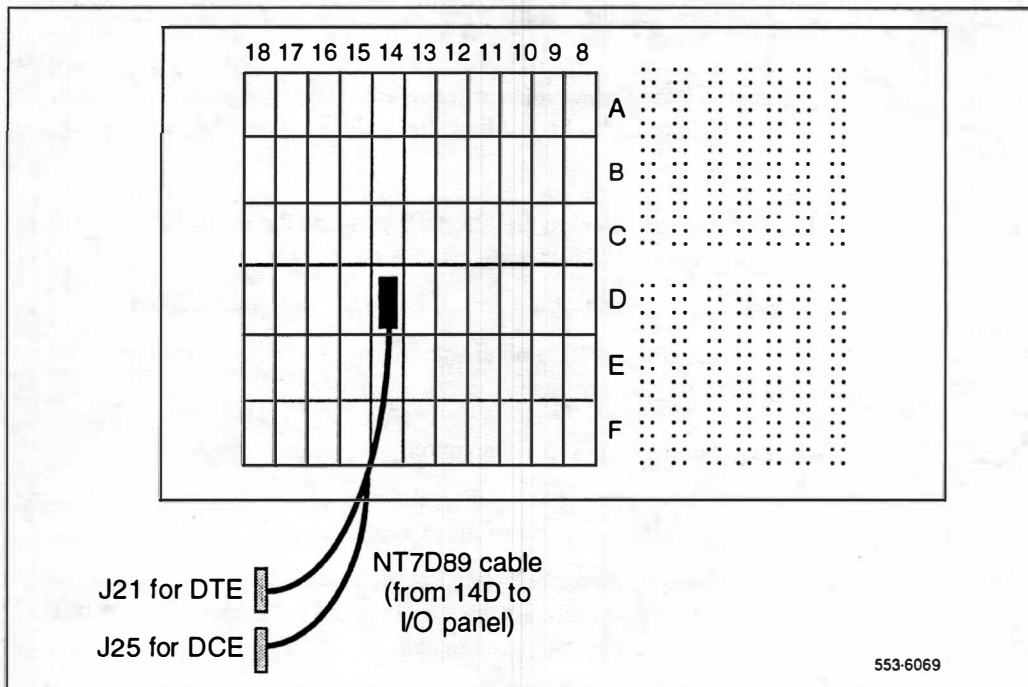
CAUTION

The numbering system for the card cage slots changed between the NT6D39 CPU/Network module and the NT9D11 Core/Network Module. A card removed from CPU module slot 3 should be placed into core module slot 2. The relative position of the card, however, will not have changed.

- 37 Follow the steps below to install the NT7D89 RS-232 cable that connects the CPSI ports on the NT6D66 CP Card to the left I/O panel. The Y-cable connects one backplane connector to two connectors on the I/O panel (see Figure 29-12).

Note: The inside of the I/O panel faces the backplane. The word LEFT faces the outside of the module. The slot numbers listed below match the designations on the outside of the panel.

- On the inside of the I/O panel, connect port A (DTE) to J21.
- On the inside of the I/O panel, connect port B (DCE) to J25.
- Connect the single connector end of the cable to backplane connector position 14D.

Figure 29-12**NT9D11 Core/Network Module (rear)—RS-232 cable connections for CPIO ports**

- 38 Install the first NT8D99AB D and E cable from the backplane connector labeled D in Core 0.
- 39 Install the second NT8D99AB D and E cable from the backplane connector labeled E in Core 0.
- 40 Follow the appropriate steps below to connect the clock controller cables:
 - For a QPC471 card, connect the NT8D75 cable from J3 (on the faceplate of the clock controller card) in Core 0.
 - For QPC775 Clock Controller Cards, connect the NT8D75 cables from J2 (on the faceplate of the clock controller card) in Core 0.
 - Leave the ENB/DIS switch set to DIS on QPC471 or QPC775 cards.

- 41 Connect any remaining network and serial cables to the network cards installed in slots 0 through 8. The cables should go to exactly the same connector that they were connected to on the old CPU module.

Note: You may have cables left over after completing this step. You should leave these cables installed until the new Option 51C switch has been tested and is working correctly. They will be removed later in this procedure.

- 42 Connect a terminal to the J25 (DCE) port on the I/O panel in Core 0. You must use the following settings on the terminal:

9600 baud, 7 data, space parity, 1 stop bit, full duplex, XON

Note: Refer to "Terminal and modem connections" before connecting the terminal.

- 43 Perform the appropriate step to turn on power to the column:
- For AC-powered systems, set the main circuit breaker to ON (up position) in the rear of the pedestal.
 - For DC-powered systems, set the breaker to ON (up position) in the pedestal, then set the switch to ON (up position) on the power supply in the individual modules.

- 44 Enable the NT6D63 IOP Card in Core 0 by setting the ENB/DIS switch to ENB.

As the card performs card level power-up tests, watch the faceplate display for error codes. See X11 input/output guide (553-3001-400) for an explanation of the codes.

- 45 Enable the NT6D64 CMDU Card in Core 0 by setting the ENB/DIS switch to ENB.

- 46 Reset the NT6D66 CP Card in Core 0 by pressing the Man RST button on the front panel. As the card performs card level power-up tests, watch the LCD display and output from the CPIO port for error messages:

Following the "Selftest Complete" message, watch the LCD on the CP card for the message "IOP in Slot 16."

Note: The software on the floppy disks is normally shipped preinstalled on the hard disks in the CMDUs. If you received hardware and software separately, or if there is any indication that the software on the floppy disks may not match the hard disk, you must also upgrade the software and the CP and IOP ROMs. Use the instructions in Procedure 11: Option 51C and 81 Installation tool, Software conversion procedures (553-2001-320) to perform this upgrade.

Upgrading core 0 and converting the customer database

To convert and install the customer database on Core 0, you will need the B disk previously removed from the Option 51. Refer to "Converting to Option 81 Media" in the Option 81 Installation tool reference, Software conversion procedures (553-2001-320).

- 1 Insert disk A1 from the software upgrade package into CMDU 0.
- 2 Set the NORM/MAINT switch on the NT6D66 CP card in Core 0 to MAINT.
- 6 Press the Man RST button on the CP card in Core 0.
- 7 Select the following options in sequence, and insert the B diskette containing the customer database (that you converted during the upgrade preparation procedures) when you are prompted to do so:

<d>	to install the database
<c>	to transfer the pre-Option 51C database
<a>	to transfer the database to hard disk
<a>	to convert from a 2 Mbyte floppy disk
or	
	to convert from a 4 Mbyte floppy disk
<y>	to begin the installation
<a>	to confirm the database conversion

Follow all screen directions until the database transfer is complete.

- 8 Select the following options to quit and reload the system:

<d>	to quit
<c>	to confirm quit

- 9 Remove any diskettes from the floppy drive, and type:

 <a> to reboot the system
- 10 Watch the terminal for system reload (SYS) and initialization (INI) messages. Following this, Core 0 is operational. If the sysload or initialization fails, refer to "Troubleshooting" on page C1.
- 11 Configure networks as CNI groups, based on the number of CNI cards in the system. In an Option 51C configuration, there is only one CNI card and one network group. See X11 input/output guide (553-3001-400) for a complete description of the Configuration Record (LD 17).
- 12 Evaluate the number of call registers and 500 telephone buffers that are configured for the system (suggested minimum values are 1000 and 500, respectively). If changes are required, reconfigure the values in LD 17.
- 13 Load overlay 22 and print the Configuration Record to verify the above changes:

 LD 22 to load the program
 REQ PRT to set the print option
 TYPE CFN to print the configuration
 After verifying the changes, enter:

 **** to exit the program
- 14 Load the Equipment Data Dump Program (LD 43). At the prompt, enter

 LD 43 to load the program
 When "DATABASE BACKUP COMPLETE" or "DATADUMP COMPLETE" appears on the terminal, proceed to the next step.

CAUTION

If the data dump is not successful, do not continue; contact your technical support organization. A data dump problem must be corrected before proceeding.

- 15 Set the ENB/DIS switch to ENB on the clock controller card in Core 0.

- 16 Set the ENB/DIS switch to ENB on the CNI card in Core 0.
- 17 Set the ENB/DIS switch to ENB on all of the cards in the network area of the Core/Network module.
- 18 Press the Man INT button on the CP card in Core 0. Watch the initialization process. Make sure the CNI and 3PE cards are auto-enabled (the faceplate LEDs should go out).

Note: If the network loop corresponding to a CNI port is not enabled, the LED for that port may not go out

- 19 Check for dial tone. If there is no dial tone:
 - Perform a visual check of the core module. Verify that each card is in the correct slot. Verify that all cards are seated, all ENB/DIS switches are set to ENB, and all red LEDs are off.
 - Verify that all cables are properly and securely connected in the front and rear of the module.
 - Check the status of the CNI cards with LD 135 "STAT CNI" and ensure all configured CNIs are software enabled.
 - If any configured CNI cards are software disabled, test the card with LD 135 "TEST CNI c s."
 - If the test is successful, enable the card in LD 135, perform a data dump with LD 43, and recheck the CNI status in LD 135.
 - Check for dial tone again.
- 20 Following a successful dial tone test, perform the following basic sanity tests:
 - Make sure calls can be placed.
 - Check for error messages, line noise, chatter, etc. Track sources and resolve problems as necessary.

The upgrade of Core 0 is complete, and the customer database is converted. The system is operating in split-mode with call processing on Core 0.

Backing up the database

- 1 In the Configuration Record (LD 17), add LD 135 and LD 137 to the midnight routines. Remove LD 35, but leave LD 37 selected.
- 2 Insert one of the **BACKUP DATABASE DISK** from the set of installation diskettes into CMDU 0. Load overlay 43 and datadump to the backup disk.

- 3 Load the Equipment Data Dump Program (LD 43). At the prompt, enter

LD 43 to load the program

When "EDD000" appears on the terminal, perform the data dump. At the prompt, enter

EDD to begin the data dump

When "DATABASE BACKUP COMPLETE" or "DATA DUMP COMPLETE" appears on the terminal, proceed to the next step.

CAUTION

If the data dump is not successful, do not continue; contact your technical support organization. A data dump problem must be corrected before proceeding.

At this stage, the upgrade is complete. To confirm system operation, continue with the steps in "Completing the upgrade".

Completing the upgrade

To complete the card cage upgrade, perform the following steps:

- 1 Clear displays, major alarms, and minor alarms:

CDSP to clear the display

CMAJ to clear all major alarms

CMIN ALL to clear all minor alarms

******** to exit LD 135

- 2 Load overlay 60 and software enable clock controller cards and any PRI/DTI cards in the Core Module:

LD 60	to load the program
ENL CC x	to enable clock controller card 0 or 1
TRCK aaa	if necessary, to set tracking
ENLL loop	to enable the specified network loop and associated PRI/DTI card
****	to exit the program

- 3 For the Core/Network Module, install the appropriate trim panels from the upgrade package.
 - 4 Perform all applicable acceptance test procedures in *System installation procedures* (553-3001-210).
-

Meridian 1 NT8D11 module upgrade to Meridian 1 Option 51C

This procedure is used to upgrade a Meridian 1 NT8D11 module (Option 21 or 21E) to Meridian 1 Option 51C. To upgrade to a Meridian 1 Option 51C system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51C:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing data base. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51C operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 51C is operating with the new software provided with it.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51C operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Modular Upgrade of a Meridian 1 NT8D11 module to Meridian 1 Option 51C

Equipment required

Table 30-1 lists minimum hardware requirements needed to upgrade an NT8D11 module to a DC powered Meridian 1 Option 51C system.

Table 30-1

Minimum hardware requirements for a Meridian 1 Option 51C

Quantity			
AC System	DC System	Part number	Description
	1	NT6D41AB	CE Power Supply DC
1	1	NT6D63AA	Input/Output Processor (IO) Pack
1	1	NT6D64AA	Core Multi-Drive Unit (CMDU)
1	1	NT6D65AA	Core Network Interface (CNI) Pack
1	1	NT6D66AA	Call Processor (CP) Pack
1	1	NT6D6003	Core Bus Terminator (CBT) Pack
1		NT7D00AA	Top Cap AC
	1	NT7D00BA Rls 2	Top Cap DC
	1	NT7D09CA	Pedestal DC
	1	NT7D10CA	System Monitor Panel Assembly
	1	NT7D67CA	Power Distribution Unit and filter assembly
1	1	NT8D17AA Rls 9	Conference/TDS Card
1	1	NT8D22AC	System Monitor
1		NT8D27AB Rls 3	Pedestal AC
1		NT8D29AA Rls 4	CE/PE power supply AC
1	1	NT8D41AA Rls 2	2 Port SDI Paddle Board
1	1	NT8D46AG	System Monitor to SDI Paddle Board Cable
1	1	NT8D46BH	System Monitor to MDF Cable
-continued-			

Table 30-1 (continued)

Minimum hardware requirements for a Meridian 1 Option 51C

Quantity			
AC System	DC System	Part number	Description
1		NT8D52AA	Pedestal Blower unit AC
	1	NT8D52DC	Pedestal Blower Unit DC
1		NT8D53AB RIs 5	Power Distribution Unit AC
1	1	NT8D84AA	SDI Paddle Board to I/O Cable
	1	NT8D85AZ	CMA to CMA, 5 ft (1520 mm)
1	1	NT8D80AZ	CMA to CMA, 5 ft (1520 mm)
1	1	NT8D93AJ	SDI Paddle Board I/O to DTE/DCE, 16 ft (4875 mm)
1	1	NT8D99AB	Network to Network Module Cable 2 ft (610 mm)
1	1	NT9D11DC	Core Network (CN) Module
1	1	QPC43R	Peripheral Signaling Card
	1	QPC84Q	Power Monitor
1	1	QPC441B Series D	3 Port Extender Card
1	1	QPC477-9A	Bus Terminating Units
1	1	QPC477-10B	Bus Terminating Units

Note: The vintages shown on circuit cards in Table 30-1 are minimum vintages. Ensure the vintage of circuit cards used are as shown or later. If no vintage is indicated in the table, any vintage can be used.

Summary of steps to upgrade

Upgrading consists of:

- installing the Meridian 1 Option 51C system next to the existing equipment
- activating and configuring the new system
- cutting-over
- removing equipment no longer required

Essentially only the existing peripheral and power equipment remain in place in the existing modules.

Note: The existing Option 21 or 21E CE/PE module is no longer required and may be removed after completion of the upgrade. However, if it is located within a column containing other equipment (such as IPE or Meridian Mail) it may be preferable to leave it, unused, in its present location.

Installing the Meridian 1 Option 51C system

The Option 51C equipment is pre-assembled at the factory according to customer system requirements. The package includes pre-installed pedestal, Core Network modules, IPE module, circuit cards, and top cap. CMDUs and power supplies are shipped in a separate package to prevent damage to the cards and must be installed.

Before proceeding, make sure that the existing power and grounding requirements are met. Refer to 553-3001-150, *Upgrade engineering*, for details about power and grounding methods and requirements.

Perform the steps in the following list (as described in 553-3001-210, *System Installation Procedures*) and install the Option 51C equipment.

Note: Refer to 553-3001-210, *System Installation Procedures*, in the section titled "Initial Meridian 1 installation", for detailed information about each topic shown in the following list of steps. Perform only the steps indicated in the following list.

- Prepare the equipment for installation.
- Place the fourth module on a column (if required).
- Position and level equipment.
- Install overhead cable tray kits (if required).
- Install power supplies in all modules.
- Plan and designate the main distribution frame (MDF).
- Install power fail transfer units (PFTUs) if required.
- Configure the system monitor. (See Table 30-2 for switch settings).
- Install a system terminal and a serial data interface (SDI) port.
- Install cabling:
 - Cable common equipment
 - Cable network loops (within the Option 51C columns only).

Note: Do not install the network cables to the existing cabinets at this time. Install only the cables within the new columns.

- Cable PE/IPE modules to the MDF and connect lines and trunks.

- Inspect Option 51C equipment in the system.
 - All cards must be locked into their assigned slots.
 - All connectors must be secured.
 - All circuit breakers must be set to OFF.
 - All trim panels must be in place.
 - All faceplate switches must be set to ENB.

Figure 30-1 shows Option 51C circuit cards installed in their typical card slots.

The following table gives the switch settings for the NT8D22 system monitor in upgraded systems.

Table 30-2

NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 30-2 (continued)**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 30-2 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves				Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."					
For each slave, indicates the slave address				Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."					
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master		on						
	slave		off						
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

Table 30-2 (continued)

NT8D22 system monitor — settings for total number of slaves — SW2 on master

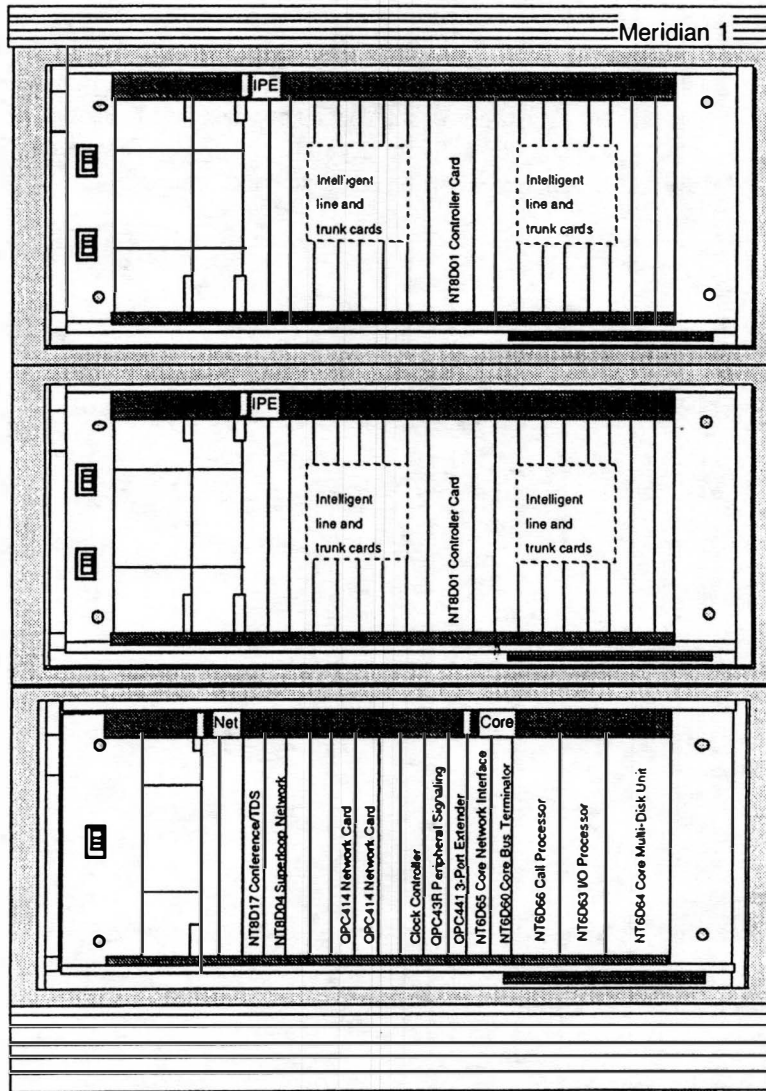
How many slave units	Switch position						How many slave units	Switch position					
	3	4	5	6	7	8		3	4	5	6	7	8
0	on	on	on	on	on	on	32	off	on	on	on	on	on
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
— continued —													

Table 30-2 (continued)

NT8D22 system monitor — slave address — SW2 on slave

Slave unit address							Position						
	3	4	5	6	7	8		3	4	5	6	7	8
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
32	off	on	on	on	on	on							

Figure 30-1
Meridian 1 Option 51C Core Network and IPE modules



553-6133

Connecting system ground and power
Ground

Refer to 553-3001-120, *Meridian 1 Installation and Planning*, for details about grounding methods and requirements.

Power

There are two versions of Meridian 1 Option 51C: one designed to operate from a 208 V AC power source, and one designed to operate from a -48 V DC power source. Refer to 553-3001-210, *System Installation Procedures*, for details about connection power to the columns.

Activating and configuring the system

Before you start up the system, review the installation steps and verify that all circuit cards are in the appropriate card slots and are properly cabled.

To start up the Option 51C system:

- 1 Power up and initially load the Option 51C column as described in 553-3001-210, *System installation procedures*.

Note: Verify the system configuration for the presence of customer data. If customer data is present, an *In-house customer software conversion* or *Distributor software conversion* was performed.

- 2 Verify the system by using test procedures described in 553-3001-210, *System installation procedures* and 553-3001-400, *X11 input/output guide*. Clear any faults discovered during testing as described in 553-3001-400, *X11 input/output guide*.
 - 3 If required, reenter customer data in the following sequence if the *In-house software conversion* or the *Distributor software conversion* methods are not used:
 - Configure network loops to match loop types and loop numbers of the existing system configuration.
 - Configure I/O devices as in the existing system.
 - Reenter customer data blocks. System options and features must be set as in the existing system.
 - Configure station data blocks.
 - Configure route data blocks.
 - Configure trunk data blocks.
 - Configure remaining system configuration records.
 - Verify system operation before adding new equipment.
 - Configure new equipment and functions, if any.
 - 4 The Meridian 1 Option 51C system is now operational.
-

Cutting-over

The following procedure describes how to cut-over to the Option 51C system. The existing equipment is left in-place until after the cut-over is completed.

CAUTION

Service on the entire system will be interrupted while performing the following procedure. Make sure that emergency transfer lines are available if required.

- 1 Follow the appropriate step below to turn off power in the existing CE/PE module and in each Core Network Module:
 - With AC power, set the circuit breaker on the MPDU in the Module to OFF (down).
 - With DC power, set the switch on the module power supply to OFF (down).
- 2 Label each network card that is being transferred from the existing CE/PE Module to a Core Network Module with the group (0-4), shelf (0 or 1), and loop (0-159) for the card.
- 3 On all Network cards that are being transferred, disable the faceplate switches, disconnect all cables, and remove the cards.
- 4 Install all of the Network cards that are being transferred to Core Network Modules. Verify that the cards are installed in the correct slots.
- 5 Connect all cables to the cards. Enable the faceplate switches.
- 6 If required, connect the Network cables to the remaining PE equipment.
- 7 If required, transfer any IPE cards from the CE/PE module to another IPE module.
- 8 Restore power in each Core Network Module.

Note: The power in the NT8D11 CE/PE module can remain OFF.

Meridian 1 NT8D11 card cage upgrade to Meridian 1 Option 51C

This procedure is used to upgrade a Meridian 1 NT8D11 module (Option 21 or 21E) to Meridian 1 Option 51C. To upgrade to a Meridian 1 Option 51C system, you must upgrade both the hardware and the software. This document describes how to upgrade the hardware and what software conversion methods are available.

Software conversion methods

Before starting, determine the type of software conversion method that will be used with this upgrade. There are three methods of converting the existing database so that it can be used in the Meridian 1 Option 51C:

1) In-house software conversion

With this method, the customer provides a copy (on tape or disk) of the existing database. The manufacturer converts the database to the target software release and provides the converted database on disks. The disks can then be used to make the Meridian 1 Option 51C operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

2) Manual data entry

With this method, the database is re-entered manually once the Option 51C is operating with the new software provided with it.

3) Distributor software conversion

With this method, all software media is provided to perform the software conversion by the distributor. It is recommended that the software conversion be performed in a laboratory environment to avoid multiple service interruptions to the end users. The disks can then be used to make the Meridian 1 Option 51C operational. However, some parameters may have to be reviewed (such as XCT, buffers, background overlays) to ensure proper operation of the system.

Card cage upgrade of a Meridian 1 NT8D11 module to Meridian 1 Option 51C

Equipment required

Table 31-1 lists the minimum items required to upgrade an AC-powered or DC-powered system to an Option 51C. Some configurations may require items not included in the table. All required items must be identified and on hand before you begin the upgrade.

Letters at the end of the part number may represent the minimum vintage of the upgrade equipment. Only equipment of that vintage or later can be used. Refer to Product compatibility (553-3001-156) for equipment compatibility information.

Network cables are required to connect network loops in the cabinet to network cards in the column. The number of cables required depends on the number of network cards installed. These are the cables:

- NT8D88 cables that connect network cards to the Core/Network module I/O panels
- NT8D98 cables that connect the I/O panels in the Core/Network module to the IPE module I/O panels
- NT8D92 cables that connect the peripheral controller to the IPE module I/O panels

Refer to Upgrade engineering (553-3001-150) for additional information on cable requirements.

An NT8D01 Controller Card is provided to support the intelligent peripheral cards in the new IPE Module. If analog peripheral cards are used in the IPE Module, one ringing generator (NT8D21AA for AC or NT6D42CC for DC) must be installed.

Table 31-1**Minimum hardware requirements for a Meridian 1 Option 51C**

Quantity		Part number	Description
AC System	DC System		
1	1	NT1R91AA	Modem Kit
	1	NT6D40AB	Peripheral Equipment Power Supply, DC
	1	NT6D41AB	Common Equipment Power Supply, DC
1	1	NT6D6003	Core Bus Terminator Card (CBT)
1	1	NT6D63AA	I/O Processor Card (IOP)
1	1	NT6D64AA	Core Multi Drive Unit (CMDU)
1	1	NT6D65AA	Core to Network Interface Card (CNI)
1	1	NT6D66AA	Call Processor Card (CP)
1		NT7D00AA	Top Cap, AC
	1	NT7D00BA	Top Cap, DC
1	1	NT7D06AA	Filler Panel
	1	NT7D09CA	Pedestal, DC
	1	NT7D10CA	System Monitor Panel
	1	NT7D67CB	Power Distribution Unit, DC
1	1	NT8D01BC	Controller-Four Card
1	1	NT8D04BA	Superloop Network Card
1		NT8D06AA	Peripheral Equipment Power Supply, AC
1	1	NT8D17FA	Conference/TDS Card
1	1	NT8D22AC	System Monitor
1		NT8D27BB	Pedestal, AC
1		NT8D29AB	Common Equipment Power Supply, AC
— continued —			

Table 31-1 (continued)

Minimum hardware requirements for a Meridian 1 Option 51C

Quantity		Part number	Description
AC System	DC System		
1		NT8D37BA	Intelligent Peripheral Equipment Module, AC
	1	NT8D37EC	Intelligent Peripheral Equipment Module, DC
1	1	NT8D41AA	Dual-Port SDI Paddle Board
1	1	NT8D46AG	System Monitor to SDI Paddle Board Cable (34 in.)
1	1	NT8D46BH	System Monitor to MDF Cable (32 ft.)
1		NT8D52AB	Pedestal Blower Unit, AC
	1	NT8D52DD	Pedestal Blower Unit, DC
1		NT8D53BB	Power Distribution Unit, AC
2	2	NT8D84AA	SDI Paddle Board to I/O Cable (18 in.)
1	1	NT8D91AE	Network to Controller Cable (8 ft.)
1		NT9D11AA	Core/Network Module, AC
	1	NT9D11DC	Core/Network Module, DC
3	3	NTND21AA	Module Side Cover
1	1	QPC43R	Peripheral Signalling Card (PS)
1	1	QPC441F	Three-Port Extender Card (3PE)
1	1	QPC471H	Clock Controller
1	1	QPC477A9	Bus Terminator Unit
1	1	QPC477B10	Bus Terminator Unit

Note 1: One ringing generator (NT8D21AA for AC; NT6D42CC for DC) must be added for each IPE module in which analog type peripheral cards are to be used.

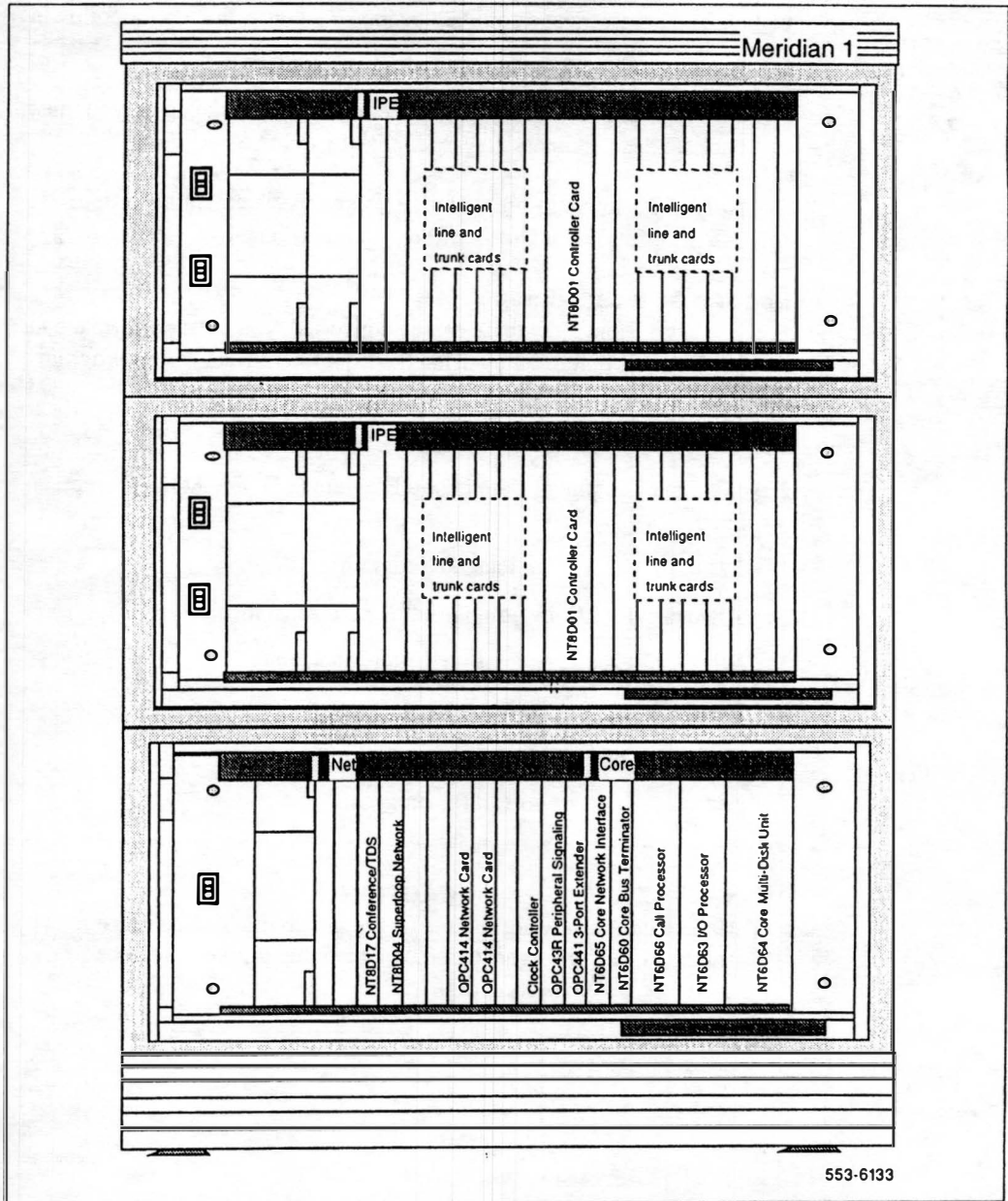
Note 2: Determine whether additional NTND21AA Module Side Covers (to cover all exposed sides of modules) and NT8D49AA Column Spacert Kits (to connect modules side-to-side) are necessary and order separately.

Summary of steps to upgrade

Upgrading consists of:

- performing a data dump and sending in your database for conversion
- removing the CE/PE card cage from the Option 21/21E
- installing the Option 51C card cage
- installing new cards in the Core/Network card cage
- powering up the system and testing

Figure 31-1
Meridian 1 Option 51C Core/Network and IPE modules



Upgrade preparation

Some preparation is required before the conversion of the Option 21 or Option 21E hardware and software begins. You must first do the following:

- Inventory all equipment required for the upgrade.
- If in-house or distributor database conversion is to be done, you must back up the customer database to disk by doing a data dump.

Note: Obtain extra-high-density floppy disks containing system software from your Northern Telecom representative.

Performing a data dump

Before your customer database can be converted, you must perform a data dump to your current disks by using the Equipment Data Dump Program (LD 43).

- 1 Log into the Option 21 or 21E.
- 2 Load the Equipment Data Dump Program (LD 43). At the prompt, enter

LD 43 to load the program

Always enter LD 43 from the source (current) media.
- 3 When "EDD000" appears on the terminal, enter

EDD to begin the data dump
- 4 Exit the program. At the prompt, enter

**** to exit the program

CAUTION

If the data dump is not successful, do not continue; contact your technical support organization. A data dump problem must be corrected before proceeding.

Converting the customer database

The customer database on the Option 21 or 21E can be sent to Northern Telecom for conversion or it may be converted by your distributor.

After your converted database is returned to you, proceed to "Removing and installing the card cage."

Note: Obtain extra-high-density floppy disks containing system software from your Northern Telecom representative.

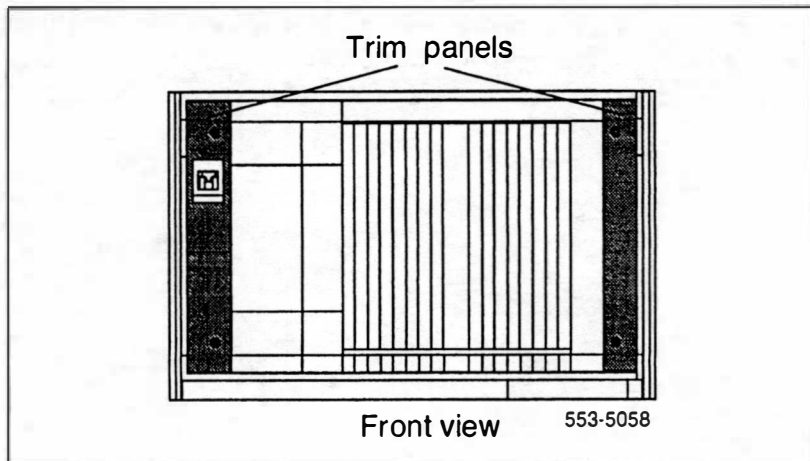
CAUTION

Upgrading an Option 21/21E to an Option 51C requires some system down time. Schedule for this when planning the system upgrade. Service will be restored when the Option 51C is fully operational.

Removing and installing the card cage

- 1 Perform the appropriate step below to turn off power to the column:
 - For AC-powered systems, set the main circuit breaker for the column to OFF (down) in the rear of the pedestal.
 - For DC-powered systems, set the switch on the NT6D41 CE Power Supply to OFF (down). Set the circuit breaker for the module to OFF (down) in the rear of the pedestal.
- 2 Remove the trim panels on both sides of the module (see Figure 31-2). Keep the screws for reuse.

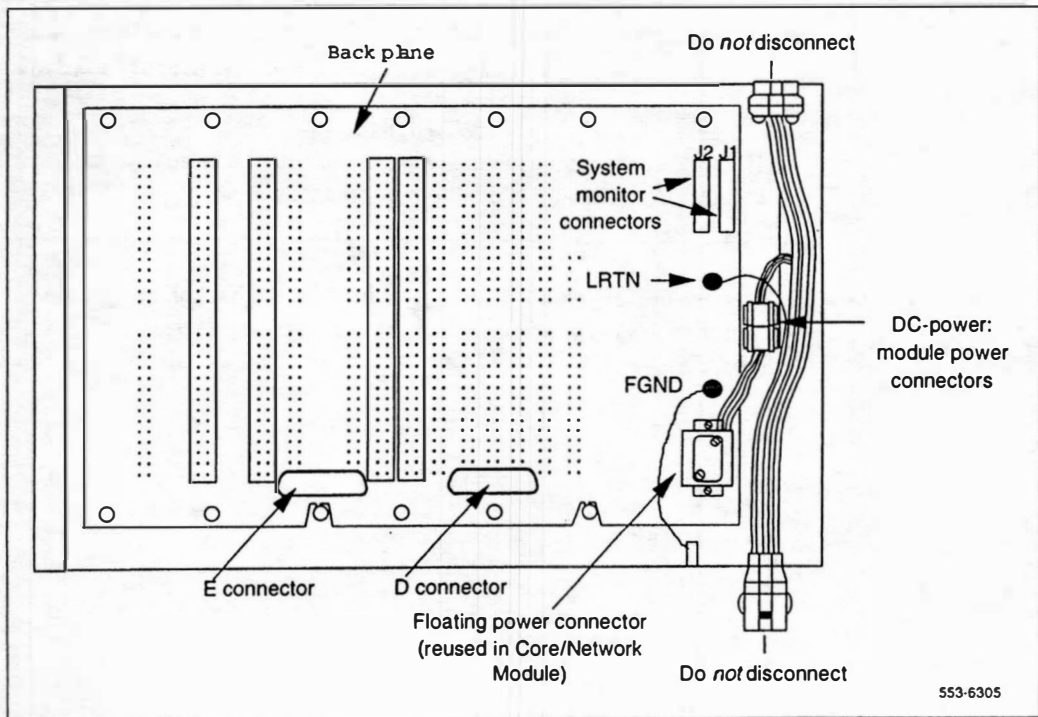
Figure 31-2
Location of the trim panels



- 3 Tag and disconnect all cables connected to the front of each card in the CE/PE module. Note the exact positions of the cables connected to cards on the network side of the card cage; they must connect to the same cards when the system is reassembled. Tape over the cable connector contacts to avoid accidental grounding. Tape or tie all cables out of the way so that the working area in front of the card cage is totally clear.
- 4 On all cards with an ENB/DIS switch on the faceplate, set the switch to DIS.

- 5 Remove the three mounting screws that secure the front of the card cage to the bottom of the module. Keep the screws for reuse.

Note: It may be necessary to temporarily remove some of the cards to get to the three mounting screws. Be sure to replace these cards back into the same slots after the screws have been removed.
- 6 Remove the I/O safety panel that covers the rear of the backplane, and tag and disconnect all cables connecting from the inside and outside of the left I/O panel.
- 7 Tag and disconnect the system monitor ribbon cables from J1 and J2 on the backplane (see Figure 31-3).

Figure 31-3**Power connectors on the rear of the AC Core/Network Module backplane**

- 8 If one or more NT8D41 Paddleboards are installed in connectors at the rear of the backplane, tag and disconnect all cables from them and remove them from the backplane.
- 9 Remove the two mounting screws that secure the rear of the card cage to the module. Keep the screws for reuse. (A 1/4" socket wrench is needed for this operation.)

WARNING

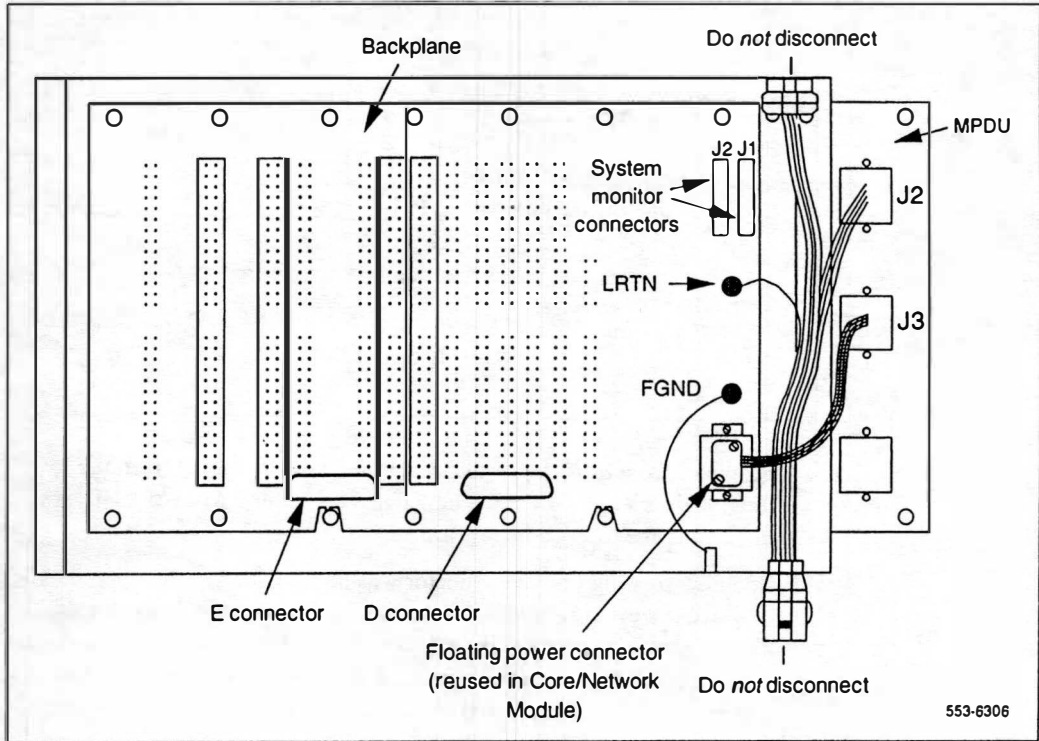
Be careful not to drop any of the screws, nuts, or washers that you remove. Parts that fall down into the blower assembly are difficult to retrieve, and could cause premature failure of the blower assembly.

- 10 Pull the card cage forward until it is halfway out of the module.

WARNING

Do not disconnect the main power connectors (the large orange connectors) at the top and bottom of the module.

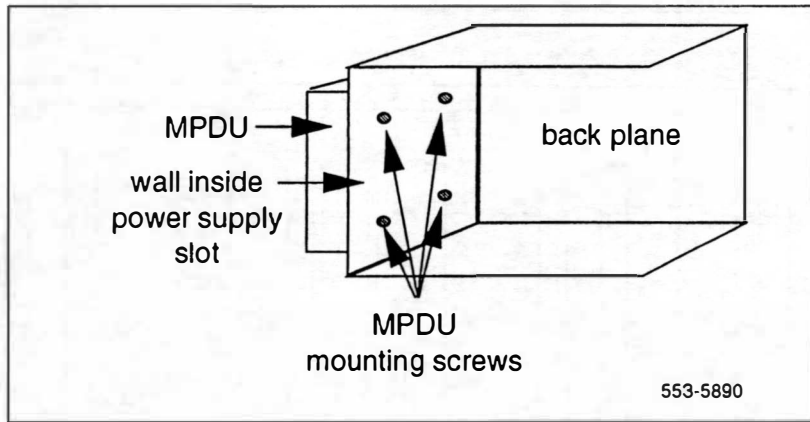
- 11 Remove the logic ground (orange) wire from the backplane bolt. Be careful to not drop the nut or lock washer into the pedestal (see Figure 31-4).

Figure 31-4**Power connectors on the rear of the DC Core/Network Module backplane**

- 12 Tag and disconnect the module power connectors. These are the small orange connectors plugged into the module power distribution unit (MPDU) with AC power, or connected to each other with DC power.
- 13 Remove the card cage from the module.

Note: For AC-powered systems: If the new NT9D11 Core/Network module did not come with a Module Power Distribution Unit (MPDU), you must remove the MPDU from the CE/PE card cage and reinstall it on the new Core/Network card cage after the CE/PE card cage is out of the module. The screw-heads for the MPDU are in the wall of the power supply slot (see Figure 31-5).

Figure 31-5
Location of the screws for the Module Power Distribution Unit (MPDU)



- 14 Remove the left I/O panel and install the new I/O panel from the upgrade package. Orient the new panel so that the word "LEFT" is located at the top and facing you.
- 15 If a new floating power connector was not included in the upgrade kit, remove the existing floating power connector (the black connector) from the rear of the CE/PE card cage. Using the same mounting screws and nuts, attach the connectors to the Core/Network card cage. Orient the connector so that pin 1 is at the bottom.

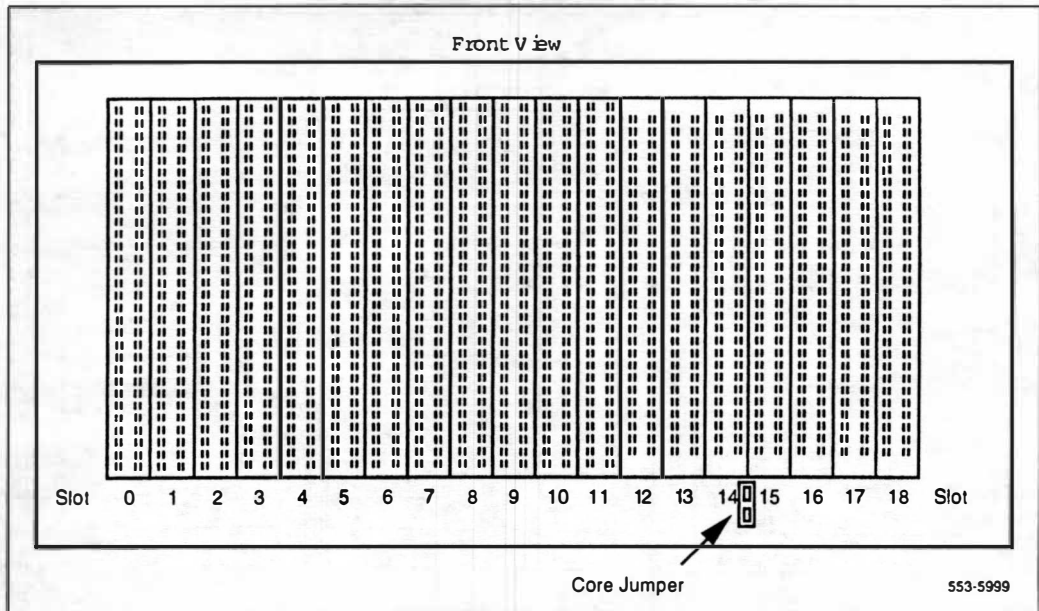
Note: Check the orientation of the connector. Viewed from the rear of the card cage, the upper left corner position should be empty (no wire) and the lower right corner position should have a wire installed. The green wire should be up.

- 16 Check the backplane jumper in the Core/Network card cage. The jumper is located near the bottom of the front side of the backplane, behind slot 14 (see Figure 31-6). Verify that the jumper is installed on the pins.

CAUTION

If the core module jumper is set incorrectly, the system will not load or operate correctly.

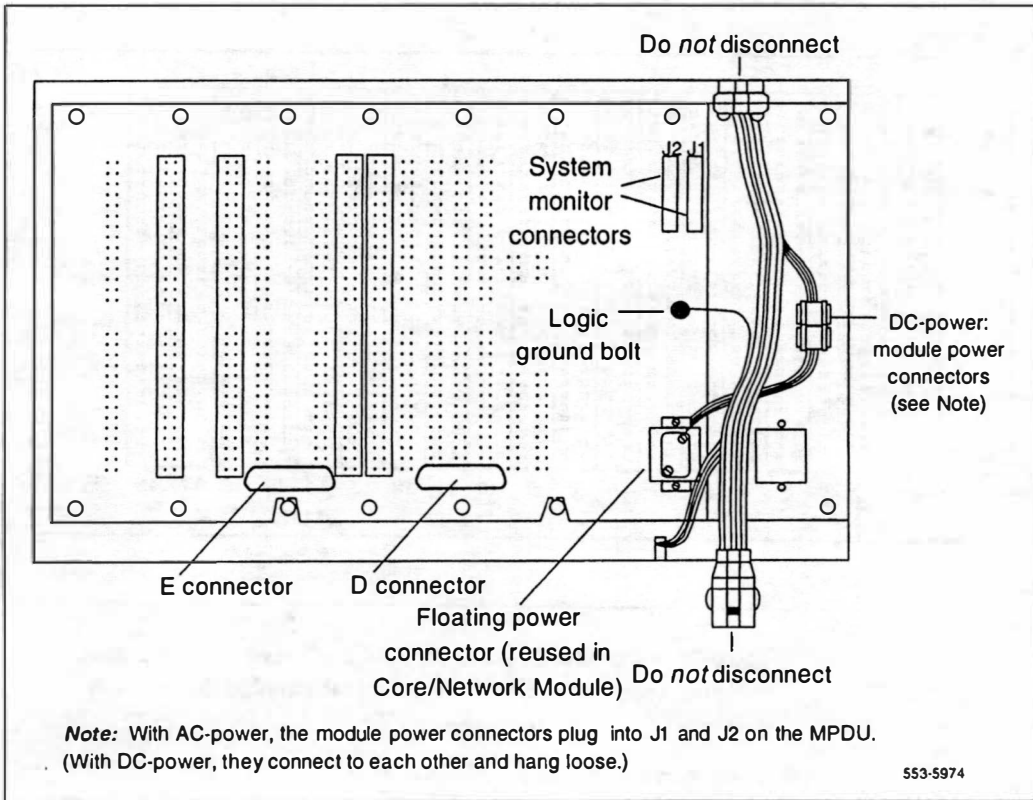
Figure 31-6
Location of the jumper on the NT9D11 backplane



- 17 Reposition the EMI shield (it looks like a brass grill) in the base of the module. Tape over the front mounting tabs to hold the shield in position. You will remove the tape later.
- 18 Slide the new card cage about half way into the module. Hold the card cage firmly while attaching the power system connectors to the rear of the module (see Figure 31-7):
 - Attach the new frame ground (green) wire to the frame ground post in each module. (A 5/16" socket wrench is needed for this operation.) Remove the nut and the lock washer at the top of the post. Put the frame ground connector over the post. Reinstall the top lock washer and the nut, then tighten the nut.

Note: For all of the terminal lugs to fit on the post, you must remove one of the lock washers. Leave a lock washer at the bottom of the post and at the top of the post. Leave a third lock washer between the second and third, or the third and fourth terminal lugs.

Figure 31-7
Power connectors on the rear of the NT9D11 Core/Network Module



- Attach the logic ground (orange) wires. Remove one nut and the lock washer. Put the connector over the post, reinstall the lock washer and nut, then tighten the nut down. (A 3/8" socket wrench is needed for this operation.)
- Connect the module power connectors to the MPDU for AC power, or to each other for DC power.
- Attach the system monitor ribbon cables. Connect the cable from the pedestal to connector J1; connect the cable from the module above to connector J2.

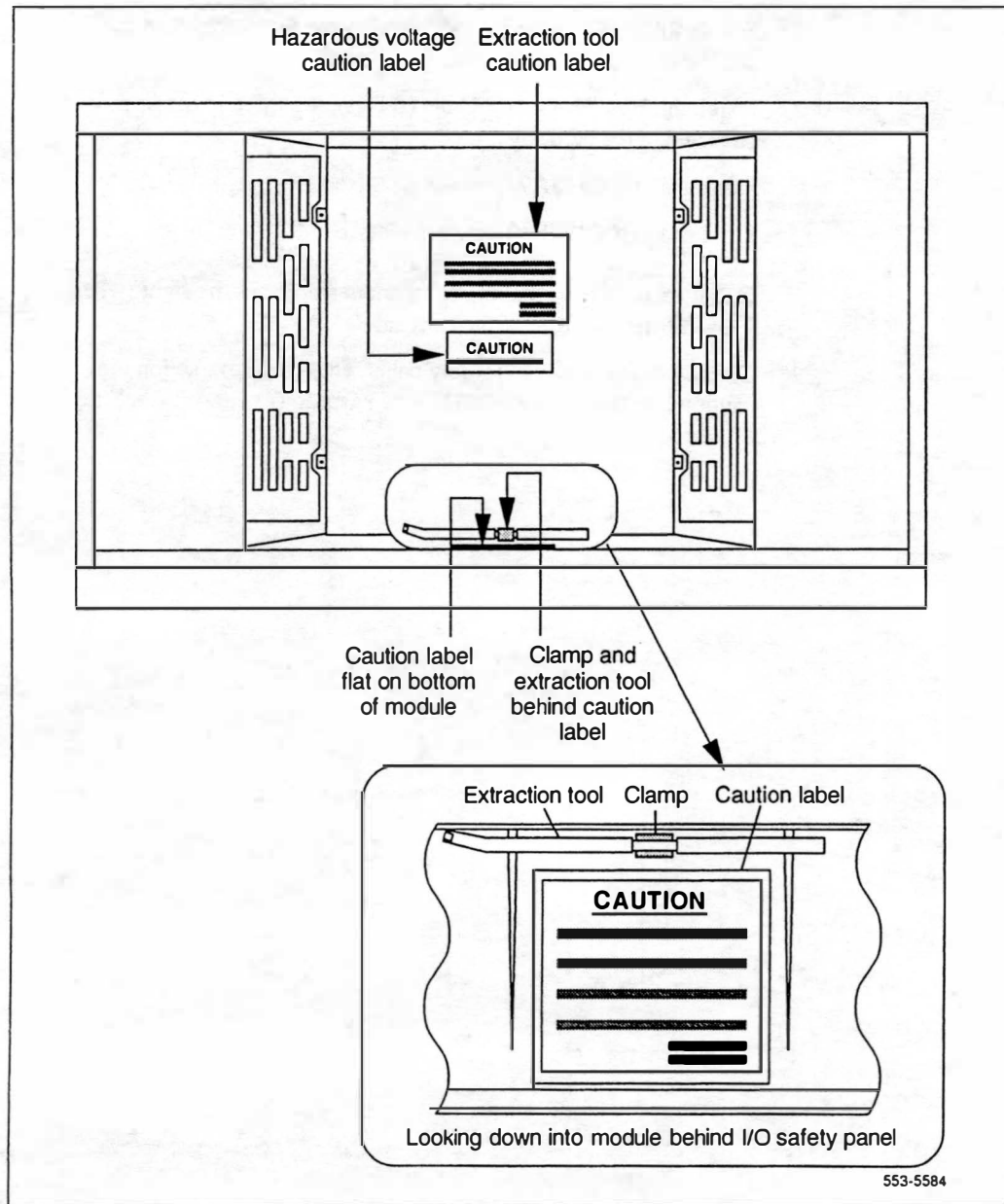
19 Slide the card cage all the way into the module.

- 20 Check the position of the EMI shield. If it has shifted, reposition it. Remove the tape holding the EMI shield.
- 21 Secure the card cage to the module with the three screws in the front and the two screws in the rear.
- 22 Install the Bus Terminator Units (BTUs), provided in the upgrade package, in the card cage:
 - Install QPC477A9 between slots 0 and 1.
 - Install QPC477B10 between slots 1 and 2.

Install each BTU so that the component side faces the right (when viewed from the front of the card cage)

- 23 On the outside of the I/O safety panel, attach one extraction tool caution label above the "CAUTION hazardous voltage" label (see Figure 31-8).

Figure 31-8
Positioning the extraction tool and caution labels



- 24 In the bottom of the module, attach the other extraction tool caution label directly behind the position of the I/O safety panel.
- 25 In the bottom of the module, attach the clamp that holds the extraction tool directly behind the extraction tool caution label you just installed.
- 26 Snap the P0741489 extraction tool into the clamp.
- 27 Attach the Core/Network Module designation labels, provided in the upgrade package, at the front and rear of the module. Attach the large label on top of the existing label. Attach the smaller label at the rear of the module.
- 28 Install the NT6D6003 CBT Card in slot 13 of the Core/Network module.

Note: All jumpers on the CBT card are preset to open (the two pins are not connected together by a jumper plug) and must be left open. (Extra jumper plugs may be stored on one pin of some of the jumpers.)
- 29 Install the module power supply (removed from the CE/PE card cage) in the slot labeled "CE pwr sup".
- 30 Turn on power to the module. With AC power, set the main circuit breaker to ON (up) in the rear of the pedestal. With DC power, set the breaker to ON (up) in the pedestal, then set the switch to ON (up) on the power supply in the module.
- 31 Check the LED on the NT6D6003 CBT Card (the LEDs are on the component side of the card, not on the faceplate). The pattern of the LEDs must be OFF-OFF-OFF-OFF, from the top down. The LED pattern is determined by the jumper setting on the backplane. If the pattern is incorrect, check the jumper on the backplane (see Figure 31-6).
- 32 Shut down power to the module again. With AC power, set the power supply breaker for the module to OFF (down). With DC power, set the switch on the power supply for the module to OFF (down).
- 33 Install the NT6D64 CMDU in slot 18.
- 34 Attach the QMM42 Security Data Cartridge (provided with the software package) to the NT6D63 IOP Card. Plug the cartridge into the connectors on the card and install the screw that secures the cartridge. Place the IOP card in slots 16 and 17 (the card occupies two slots). Set the front panel ENB/DIS switch to ENB.

- 35 Place the NT6D66 CP Card in slots 14 and 15 (the card occupies two slots).
- 36 Place the NT6D65 CNI Card in slot 12. Set the front panel ENB/DIS switch to ENB.
- 37 Check the vintage of the QPC441 3PE Card—it must be minimum vintage F. Set the front panel ENB/DIS switch to ENB. Set the Option switches and jumper on the card (see Table 31-2). Place the card in slot 11.

Table 31-2
QPC441F 3PE Card—Option settings

D20 switch							
1	2	3	4	5	6	7	8
off	on	on	off	on	on	on	on
RN27 jumper at E35: set to "A"							

- 38 Place the QPC43 PS card in slot 10. Set the front panel ENB/DIS switch to ENB.
- 39 Set the Option switches on the QPC471 Clock Controller card (must be vintage H or later) as shown in Table 31-3. Set the front panel ENB/DIS switch to ENB. Place the clock controller card in slot 9.

Table 31-3
QPC471 Clock Controller Card switch settings

Switch	1	2	3	4
SW1	On	On	On	On
SW2	Off	Off	Off	Off
SW4	Off	On	Off	Off

- 40 Remove the network cards from the CE/PE card cage and reinstall them in the new Core/Network card cage. Install the cards in slot numbers indicated in Table 31-4. Notice that although the slot numbers have changed, the relative positions of the cards in the modules have not.

Table 31-4
Slot number translation for network cards

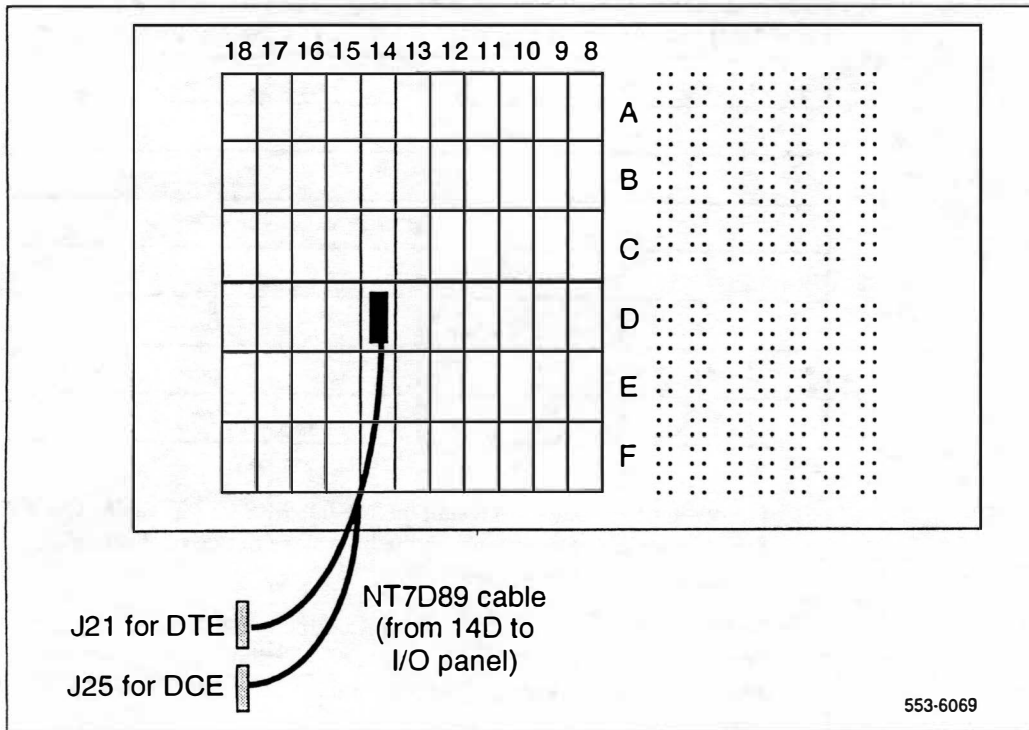
NT8D11 CE/PE Slot Number	NT9D11 Core/Net Slot Number
1	0
2	1
3	2
4	3
5	4
6	5
7	6
8	7

- 41 Follow the steps below to install the NT7D89 RS-232 Y-cable. The cable connects one connector on the backplane to two connectors on the left I/O panel (see Figure 31-9).

Note: Verify that the left I/O panel is correctly installed: the word "LEFT" faces you at the top of the panel. The connector numbers listed below match the designations on the outside of the left I/O panel.

- On the inside of the I/O panel, connect port A (DTE) to J21 (modem port)
- On the inside of the I/O panel, connect port B (DCE) to J25 (terminal port)
- Connect the single connector end of the cable to backplane connector position 14D

Figure 31-9
NT9D11 Core/Network Module (rear)—RS-232 cable connections for CPIO ports



- 42 Connect any remaining network and serial cables to the network cards installed in slots 0 through 8. The cables should go to exactly the same connector that they were connected to on the old CE/PE module.

Note: You may have cables left over after completing this step. You should leave these cables installed until the new Option 51C switch has been tested and is working correctly. They will be removed later in this procedure.

- 43 Connect a terminal to the J25 (DCE) port on the I/O panel. You must use the following settings on the terminal:

9600 baud, 7 data bits, 1 stop bit, space parity, full duplex, XON protocol

Note: Refer to "Terminal and modem connections" on page B-1 before connecting the terminal.

- 44 At the NT8D22 System Monitor in the pedestal, verify that switches SW1, SW2, and SW3 are properly configured (see Table 31-5.)

Table 31-5**NT8D22 system monitor — SW1 switch settings for upgraded systems**

SW1	Setting	Function
1	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Is not co-located with an existing system.
2	ON	This is the master system monitor — is located in column containing a CPU and is connected to an existing system containing a QPC84, QPC173, or QPC704 Power Monitor.
	OFF	Set to OFF on all slave system monitors.
	OFF	Switch 1 is set to ON and modules contain only peripheral equipment (PE)
	OFF	Is not co-located with an existing system containing a QPC84, QPC173 or QPC704 Power Monitor (switch is set to OFF).
3	ON	The entire system is DC- powered.
	OFF	The modules are AC-powered.
4	ON	The Power Fail Transfer Unit (PFTU) activates when overheating occurs.
	OFF	The PFTU will not be activated if overheating occurs.
5	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
— continued —		

Table 31-5 (continued)

NT8D22 system monitor — SW1 switch settings for upgraded systems

SW1	Setting	Function
6	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system).
	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system).
	OFF	Is not co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor (switch is set to OFF).
7	ON	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	OFF	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
8	OFF	Is co-located with a system containing a QPC84 or a QPC173 Power Monitor (such as an NT or XT system) and the modules contain only PE (the CE is in an existing cabinet).
	ON	Is co-located with an existing system containing a QPC84, QPC173, or QPC704 Power Monitor and the CPU is in a module.
	ON	Is co-located with a system containing a QPC704 Power Monitor (such as an ST and RT system) and the modules contain only PE.
	OFF	The PE and CE are located in modules only. There are no existing cabinets associated with this system.
— continued —		

Table 31-5 (continued)
NT8D22 system monitor — SW2 and SW3 settings

SW2 indication		Position							
		1	2	3	4	5	6	7	8
Master system monitor		on							
Slave system monitor		off							
Operation with ST, STE, or RT			on						
All other operation			off						
For master, indicates total number of slaves				Set 3 - 8 according to the table titled "NT8D22 settings for total number of slaves — SW2 on master."					
For each slave, indicates the slave address				Set 3 - 8 according to the table titled "NT8D22 slave address — SW2 on slave."					
SW3 indication		Position							
		1	2	3	4				
CTA	master	on							
	slave	off							
CTR	master			on					
	slave			off					
FAIL	master					on			
	slave					off			
MAJOR	master								on
	slave								off
— continued —									

Table 31-5 (continued)

NT8D22 system monitor — settings for total number of slaves — SW2 on master

How many slave units	Switch position						How many slave units	Switch position					
	3	4	5	6	7	8		3	4	5	6	7	8
0	on	on	on	on	on	on	32	off	on	on	on	on	on
1	on	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	off	on	34	off	on	on	on	off	on
3	on	on	on	on	off	off	35	off	on	on	on	off	off
4	on	on	on	off	on	on	36	off	on	on	off	on	on
5	on	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off
— continued —													

Table 31-5 (continued)
NT8D22 system monitor — slave address — SW2 on slave

Slave unit address							Position							Slave unit address							Position						
	3	4	5	6	7	8		3	4	5	6	7	8		3	4	5	6	7	8		3	4	5	6	7	8
1	on	on	on	on	on	off	33	off	on	on	on	on	off	33	off	on	on	on	on	off	33	off	on	on	on	on	off
2	on	on	on	on	on	off	34	off	on	on	on	on	off	34	off	on	on	on	on	off	34	off	on	on	on	on	off
3	on	on	on	on	on	off	35	off	on	on	on	on	off	35	off	on	on	on	on	off	35	off	on	on	on	on	off
4	on	on	on	on	off	on	36	off	on	on	on	off	on	36	off	on	on	on	off	on	36	off	on	on	on	on	off
5	on	on	on	off	on	off	37	off	on	on	off	on	off	37	off	on	on	off	on	off	37	off	on	on	off	on	off
6	on	on	on	off	off	on	38	off	on	on	off	off	on	38	off	on	on	off	off	on	38	off	on	on	off	off	on
7	on	on	on	off	off	off	39	off	on	on	off	off	off	39	off	on	on	off	off	off	39	off	on	on	off	off	off
8	on	on	off	on	on	on	40	off	on	off	on	on	on	40	off	on	off	on	on	on	40	off	on	off	on	on	on
9	on	on	off	on	on	off	41	off	on	off	on	on	off	41	off	on	off	on	on	off	41	off	on	off	on	on	off
10	on	on	off	on	off	on	42	off	on	off	on	off	on	42	off	on	off	on	off	on	42	off	on	off	on	off	on
11	on	on	off	on	off	off	43	off	on	off	on	off	off	43	off	on	off	on	off	off	43	off	on	off	on	off	off
12	on	on	off	off	on	on	44	off	on	off	off	on	on	44	off	on	off	off	on	on	44	off	on	off	on	on	on
13	on	on	off	off	on	off	45	off	on	off	off	on	off	45	off	on	off	off	on	off	45	off	on	off	on	off	off
14	on	on	off	off	off	on	46	off	on	off	off	off	on	46	off	on	off	off	off	on	46	off	on	off	off	on	on
15	on	on	off	off	off	off	47	off	on	off	off	off	off	47	off	on	off	off	off	off	47	off	on	off	off	off	off
16	on	off	on	on	on	on	48	off	off	on	on	on	on	48	off	off	on	on	on	on	48	off	off	on	on	on	on
17	on	off	on	on	on	off	49	off	off	on	on	on	off	49	off	off	on	on	on	off	49	off	off	on	on	on	off
18	on	off	on	on	off	on	50	off	off	on	on	off	on	50	off	off	on	on	off	on	50	off	off	on	on	off	on
19	on	off	on	on	off	off	51	off	off	on	on	off	off	51	off	off	on	on	off	off	51	off	off	on	on	off	off
20	on	off	on	off	on	on	52	off	off	on	off	on	on	52	off	off	on	off	on	on	52	off	off	on	off	on	on
21	on	off	on	off	on	off	53	off	off	on	off	on	off	53	off	off	on	off	on	off	53	off	off	on	off	on	off
22	on	off	on	off	off	on	54	off	off	on	off	off	on	54	off	off	on	off	off	on	54	off	off	on	off	off	on
23	on	off	on	off	off	off	55	off	off	on	off	off	off	55	off	off	on	off	off	off	55	off	off	on	off	off	off
24	on	off	off	on	on	on	56	off	off	off	on	on	on	56	off	off	off	on	on	on	56	off	off	off	on	on	on
25	on	off	off	on	on	off	57	off	off	off	on	on	off	57	off	off	off	on	on	off	57	off	off	off	on	on	off
26	on	off	off	on	off	on	58	off	off	off	on	off	on	58	off	off	off	on	off	on	58	off	off	off	on	off	on
27	on	off	off	on	off	off	59	off	off	off	on	off	off	59	off	off	off	on	off	off	59	off	off	off	on	off	off
28	on	off	off	off	on	on	60	off	off	off	off	on	on	60	off	off	off	off	on	on	60	off	off	off	on	on	on
29	on	off	off	off	on	off	61	off	off	off	off	on	off	61	off	off	off	off	on	off	61	off	off	off	on	off	off
30	on	off	off	off	off	on	62	off	off	off	off	off	on	62	off	off	off	off	off	on	62	off	off	off	off	off	on
31	on	off	off	off	off	off	63	off	off	off	off	off	off	63	off	off	off	off	off	off	63	off	off	off	off	off	off
32	off	on	on	on	on	on																					

- 45 Perform the appropriate step to turn on power to the column:
- For AC-powered systems, set the main circuit breaker to ON (up position) in the rear of the pedestal.
 - For DC-powered systems, set the breaker to ON (up position) in the pedestal, then set the switch to ON (up position) on the power supply in the module.
- 46 Reset the NT6D66 CP Card by pressing the MAN RST button on the front panel. As the card performs card level power-up tests, monitor the LCD display and the output from the CPIO port for error messages.
- Following the "Self test Complete" message, verify that the LCD on the CP card displays the message "IOP in Slot 16."

Completing the upgrade

- 1 Reenter system configuration data into the customer database, if required, in the following sequence:
 - To reassign configuration data previously moved from loop 28 to an appropriate loop in the Option 51C, do the following:
 - Define the target loop using the Configuration Program (LD 17).
 - Move the loops using the Move Data Blocks Program (LD 25).

Refer to X11 input/output guide (553-3001-400) for instructions on using LD 17 and LD 25.

- Move the network cards from the Option 21 to the network card slots previously defined.
- Configure I/O devices to reflect the current configuration.
- Evaluate the number of call registers and 500 telephone buffers that are configured for the system (suggested minimum values are 1000 and 500, respectively). Refer to Meridian I capacity engineering (553-3001-149). If changes are required, reconfigure the values in LD 17.
- Reenter customer data blocks. System options and features must reflect the current configuration.
- Configure station data blocks.
- Configure route data blocks.
- Configure trunk data blocks.
- Configure remaining system configuration records.
- Verify system operation before adding new equipment.
- Configure new equipment and functions, if any.

- 2 Load overlay 22 and print the Configuration Record to verify the above changes:

LD 22	to load the program
REQ PRT	to set the print Option
TYPE CFN	to print the configuration

After verifying the changes, enter

******** to exit the program

- 3 Load the Equipment Data Dump Program (LD 43). At the prompt, enter

LD 43 to load the program

When "EDD000" appears on the terminal, perform the data dump. At the prompt, enter

EDD to begin the data dump

When "DATABASE BACKUP COMPLETE" or "DATADUMP COMPLETE" appears on the terminal, proceed to the next step.

CAUTION

If the data dump is not successful, do not continue; contact your technical support organization. A data dump problem must be corrected before proceeding.

- 4 Verify that the ENB/DIS switch is set to ENB on all of the cards in the network area of the Core/Network module.
- 5 Press the Man INT button on the CP card. Watch the initialization process. Make sure the CNI and 3PE cards are auto-enabled. (The faceplate LEDs should go out.)
Note: If the network loop corresponding to a CNI port is not enabled, the LED for that port may not go out.
- 6 Check for dial tone. If there is no dial tone, do the following:
 - Perform a visual check of the core module. Verify that each card is in the correct slot. Verify that all cards are seated, all ENB/DIS switches are set to ENB, and all red LEDs are off.

- Verify that all cables are properly and securely connected in the front and rear of the module.
 - Check the status of the CNI card with LD 135 "STAT CNI" and ensure that it is software enabled.
 - If the CNI card is software disabled, test the card with LD 135 "TEST CNI c s."
 - If the test is successful, enable the card in LD 135, perform a data dump with LD 43, and recheck the CNI status in LD 135.
 - Check for dial tone again.
 - If dial tone is still not present, press the Man INT button on the CP card. Watch the initialization process. Make sure the CNI and 3PE cards are auto-enabled. (The faceplate LEDs should go out.)
- 7 Following a successful dial tone test, perform the following basic sanity tests:
- Make sure calls can be placed internally and externally.
 - Check for error messages, line noise, chatter, or other problems. Track sources and resolve problems as necessary.
- 8 Clear displays, major alarms, and minor alarms:
- | | |
|-----------------|---------------------------|
| LD 135 | to load the program |
| CDSP | to clear the display |
| CMAJ | to clear all major alarms |
| CMIN ALL | to clear all minor alarms |
| CDSP | to clear the display |
| **** | to exit LD 135 |

- 9 Load overlay 60 and software enable clock controller cards and any PRI/DTI cards in the Core/Network Module:

LD 60	to load the program
ENL CC x	to enable clock controller card 0 or 1
TRCK aaa	if necessary, to set tracking
ENLL loop	to enable the specified network loop and associated PRI/DTI card
****	to exit the program
 - 10 Install the appropriate trim panels from the upgrade package to the Core/Network module.
 - 11 Perform all applicable acceptance test procedures in Meridian 1 system installation procedures (553-3001-210).
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